

Tab. 1: Human endogenous retroviral elements

	HERV family	Copy number	% of genome
Class I HERVs (type C- related HERVs)	HERV-ERI HERV-E (4-1, ERVA, NP-2) HERV-E LTR 51-1 ERV1 HERV-R (ERV3) RRHERV-I	35 - 50 500 - 600 35 - 50 10 - 15 10 20	0.07 %
	HERV-T (S71, CRTK1, CRTK6) HERV-T LTR	50 - 60 150 - 200	
	ERV-FRD	8	
	HERV-RW HERV-W (MSRV) HERV-R (ERV9) ERV9 LTR	25 - 50 30 - 40 3000 - 4000	0.2%
	HERV-P (HuERS-P, HuRRS-P)	50 - 90	0.01%
	HERV-IP HERV-I (RTVL-I) HERV-IP-T47D (ERV-FTD) HERV-IP LTR	25 - 50 35 1800 - 2000	0.01%
	HERV-HF HERV-H (RTVL-H, RGH) HERV-F HERV-H-LTR	900 - 1000 16 1000	0.2%
	HERV-K <i>HERV-K(HML-1)</i> <i>HERV-K(HML-2)</i> HERV-K10 HERV-K-HTDV HERV-K-IDDM <i>HERV-K(HML3)</i> <i>HERV-K(HML-4)</i> HERV-K-T47D <i>HERV-K(HML-6)</i> HERV-K-HML-6p HERV-K-HML-6.17 <i>HERV-K(HML-7)</i> HERV-K-NMW7 <i>HERV-K(HML-8)</i> <i>HERV-K(HML-9)</i> HERV-K-NMW9 <i>HERV-K(HML-10)</i> HERV-KC4 HERV-K LTR	10 - 20 30 - 50 25 6 30 - 40 ? ? ? 10 - 50 10 000 - 25 000	0.5%
	HERV-L	100 - 200	0.02%
Foamy virus- related HERVs			

Tab. 2: Primers used for the amplification of different HERV-LTR-regions

Nr.	Primer	Sequence
34	HERV-K	ATGGCGGTTTTGTCGAA
35	HERV-K	GTTCCMTYAGTATTTATTGATC
36	HERV-K	ATGGAGCATACAATCGGG
3	HERV-K	AAGAAAAGGGGGAAATGTGGG
11	HERVKC4	AAAGGGAGGGGGGCATG
12	HERV-KT47-D	TAAAAAGGGGGGAGATG
1	HERV-H	ATGTGAGCAACATGGCTGTTATTTTC
2	HERV-H	TGTCAGGCCTCTGAGCCCAA
39	HERV-H	GCCATCTCGAGTGTGAGSCCTCTGAGYCYARGC
37	HERV-H	TATCTTGAATTCGKGTGAGCAAYAARRCTTTA
31	polydT	TTTTTTTTTTTTTTTT
17	HERV-E	AAAGGGGGGGAAATATG
18	HERV-L	AGGGGTGGGACTTGCGATG
19	HERV-W	TGTTGAGATGGGGGACTGAG
20	HERV-W	GCAGTTGCAAGATTTAATAGAG

Tab. 3: Analyzed HERV-LTR

A: HERV-LTRs from different cell lines and tissues

	Primer	Herkunft	Homology
HERV-K2	34/36	T47-D	HERV-K10, M12854, 97,9 %
HERV-K3	34/36	T47-D	HERV-K10, M12854, 98,4 %
HERV-K22-K32-K27-K45	34/36	brain	HERV-K10, M12854, 98,6 % *
HERV-K30	3/31	heart	HERV-K10, M12854, 97,6 %
HERV-K-T47D-L5		T47-D	MRSV, AF127229
HERV-K-T47D-L50		T47-D	MRSV, AF127229
HERV-K-T47D-L8		T47-D	MRSV, AF127229
HERV-K-T47D-L9		T47-D	MRSV, AF127229
HERV-K-T47D-L48		T47-D	MRSV, AF127229
HERV-K-T47D-L20		T47-D	MRSV, AF127229
HERV-IP-T47D		T47-D	MRSV, AF127229
HERV-T47D-W2	19/20	T47-D	MRSV, AF127229
HERV-T47D-W4	19/20	T47-D	MRSV, AF127229
HERV-T47D-W5	19/20	T47-D	MRSV, AF127229
HERV-W1	19/20	T47-D	MRSV, AF127229
HERV-W10	19/20	T47-D	MRSV, AF127229
HERV-W11	19/20	T47-D	MRSV, AF127229
HERV-W18	19/20	T47-D	MRSV, AF127229
HERV-W2	19/20	T47-D	MRSV, AF127229
HERV-W22	19/20	T47-D	MRSV, AF127229
HERV-W23	19/20	T47-D	MRSV, AF127229
HERV-W4	19/20	T47-D	MRSV, AF127229
HERV-W5	19/20	T47-D	MRSV, AF127229
HERV-W6	19/20	T47-D	MRSV, AF127229
HERV-W8	19/20	T47-D	MRSV, AF127229
HERV-H1	1/2	H9	Cercopithecus aethiops ERV-H; U96012, 87,1%
HERV-H8	1/2	HUT	HERV-H LTR18106, 84,8%
HERV-H13	1/2	HUT	HERV-H LTR18106, 91,8%
HERV-H19	1/2	liver	Callithrix jacchus ERV-H, 5'LTR; U96052, 92,1%
HERV-H31	1/2	liver	HERV-H(H6) x12717, 99,8%
HERV-H3	1/31	85HG66	HERV-H(H6) x12717, 100 %
HERV-H CL1	1/2	Chang Liver	HERV-H(H6) x12717, 100 %
HERV-H CL2	1/2	Chang Liver	HERV-H LTR18106, 84 %
HERV-H CL3	1/2	Chang Liver	Callithrix jacchus ERV-H, 5'LTR Silva 5, U96057, 84,2 %
HERV-H CL4	1/2	Chang Liver	HERV-H(H6) x12717, 100 %
HERV-H PA7	1/2	Panc1	Callithrix jacchus ERV-H, 5'LTR Silva 4, U96062, 85,7 %
HERV-H PA8	1/2	Panc1	Cercopithecus aethiops ERV-H, Vero 22, U96012, 87,1%
HERV-H PA9	1/2	Panc1	HERV-H LTR18106, 85 %
HERV-H PA10	1/2	Panc1	Callithrix jacchus ERV-H, 5'LTR Silva 4, U96062, 85,6 %
HERV-H MC14	1/2	MCF7	Cercopithecus aethiops ERV-H, Vero 22, U96012, 86,6%
HERV-H MC15	1/2	MCF7	Cercopithecus aethiops ERV-H, U96012, 86,6 %
HERV-H MC16	1/2	MCF7	Callithrix jacchus ERV-H, 5'LTR Silva 4, U96062, 87,4 %
HERV-H MC17	1/2	MCF7	Cercopithecus aethiops ERV-H, Vero 22, U96012, 86,6%
HERV-H MP20	1/2	MiaPaca	Human beta globin retrovirus-like repetitive element, k01891, 92,8 %
HERV-H MP21	1/2	MiaPaca	HERV-H LTR18106, 89,2 %
HERV-H MP23	1/2	MiaPaca	HERV-H(H6) x12717, 99,5 %

B: HERV-LTRs published in the literature

	(bp)	reference
HERV-K-pl167	970	Leib-Mösch <i>et al.</i> , 1993
HERV-K-T47-D	1200	Seifarth <i>et al.</i> , 1998
HERV-H-H6	393	Feuchter und Mager, 1990
HERV-T-S71A	625	Murr, Dissertation, 1998
HERV-E	391	Steele <i>et al.</i> , 1984
HERV-L	462	Cordonnier <i>et al.</i> , 1995

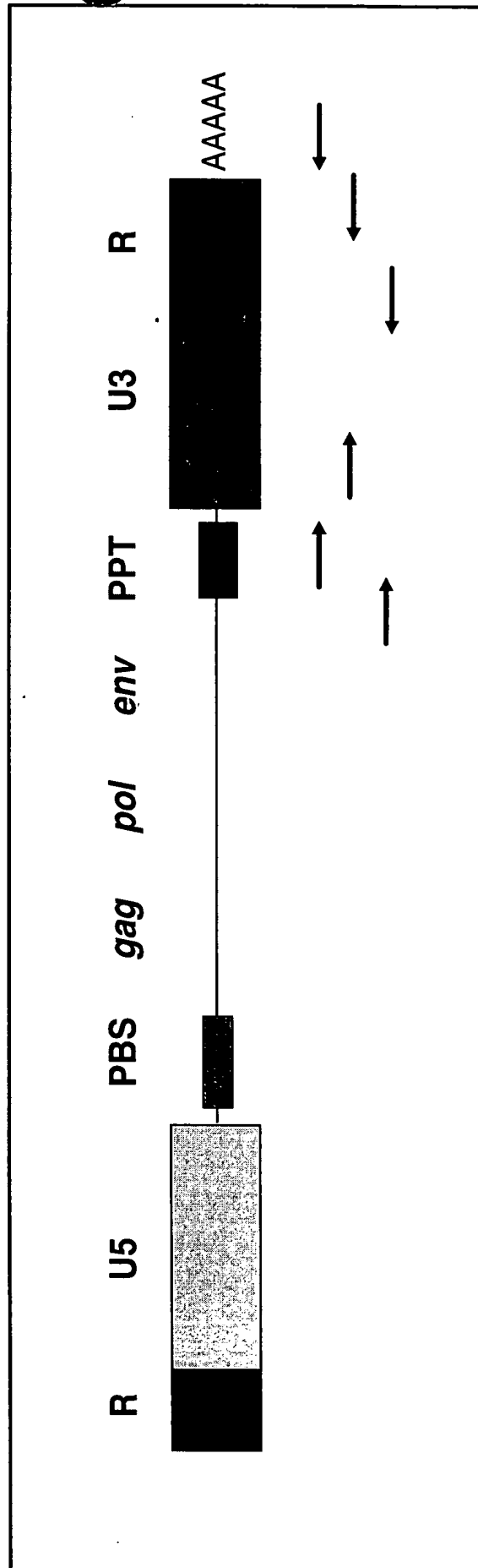
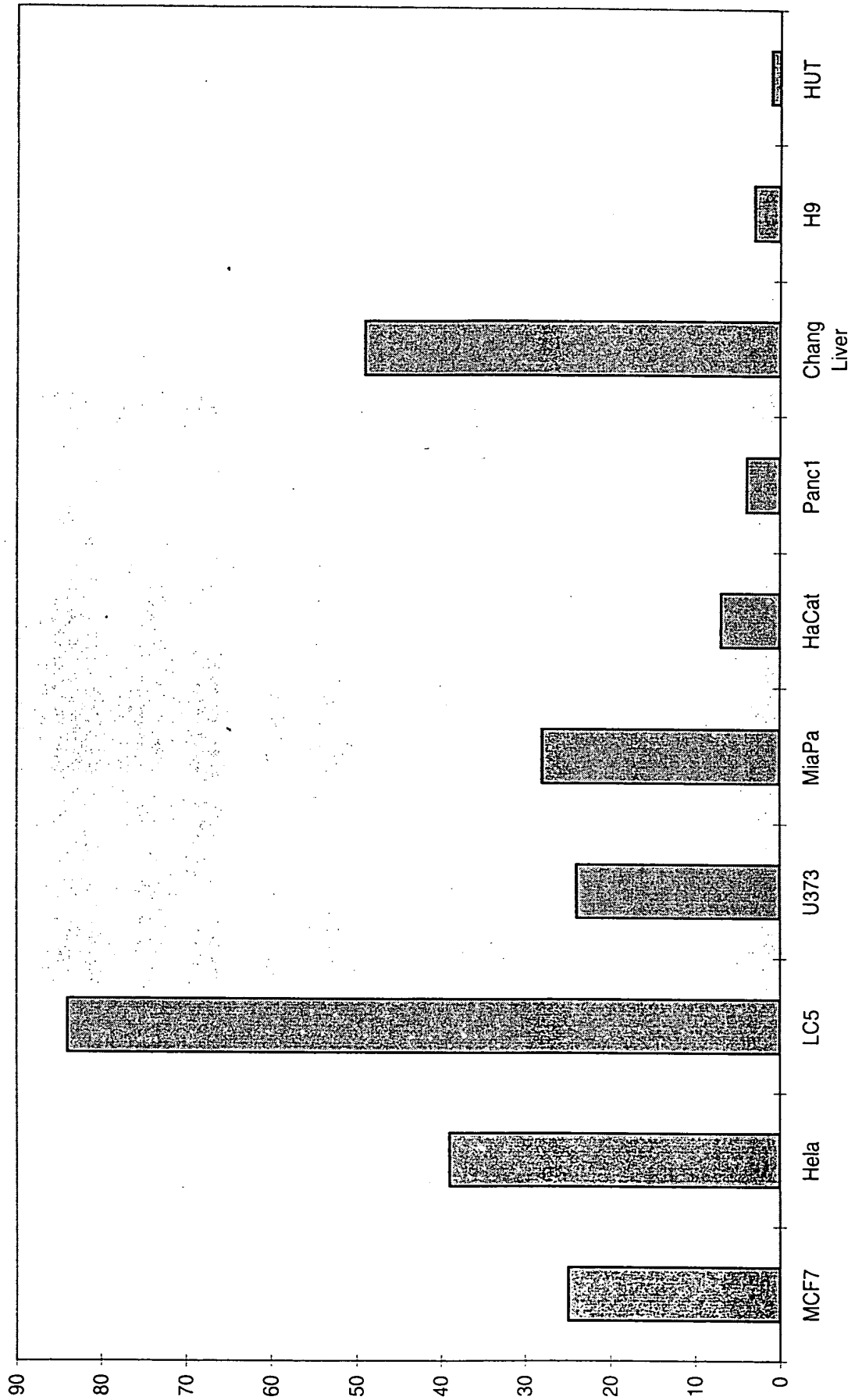


Fig.1: RT-PCR strategy to isolate U3/R-regions of transcribed HERVs

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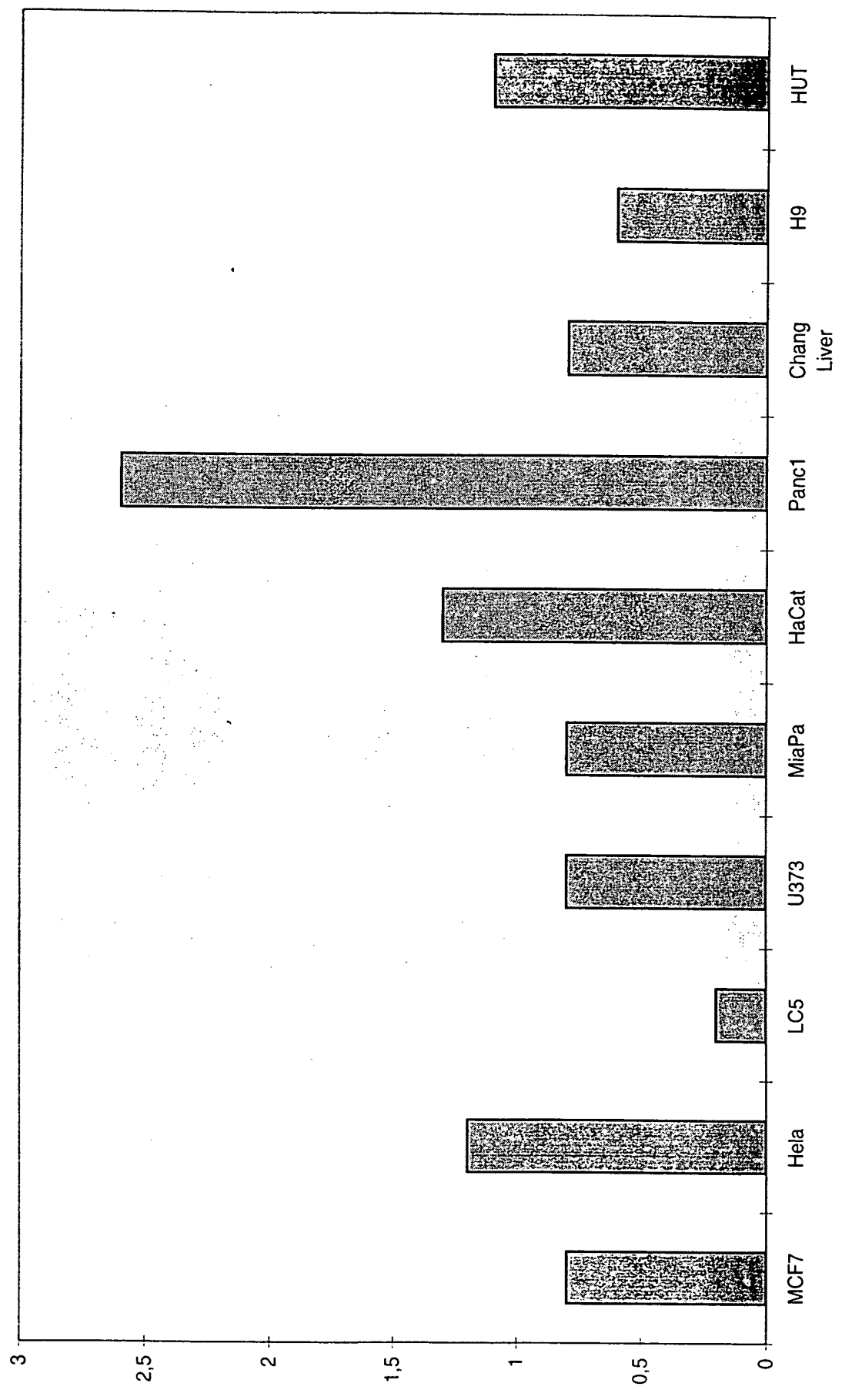
HERV-H-H6

Abb.2a)



HERV-E

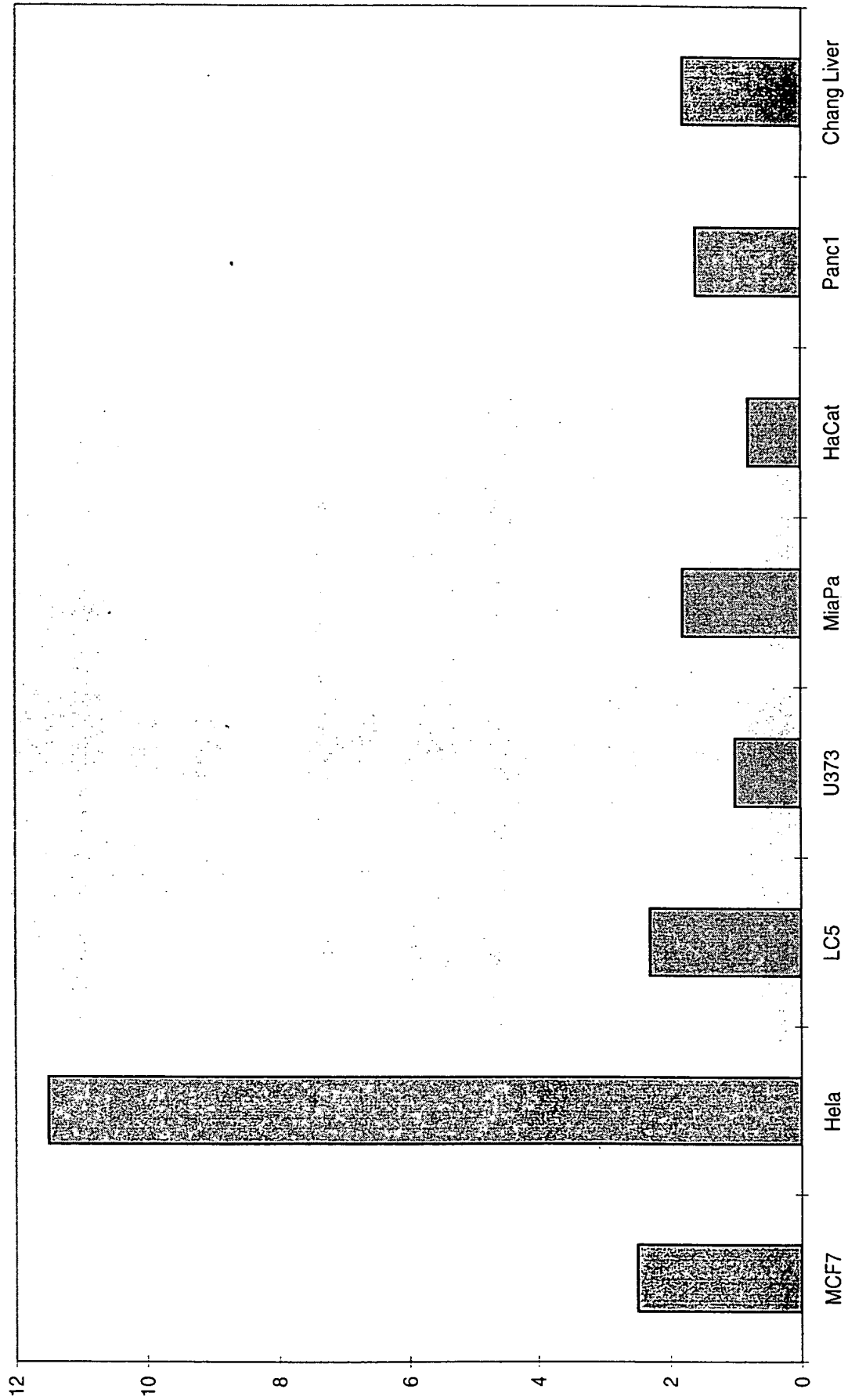
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HERV-Kp167

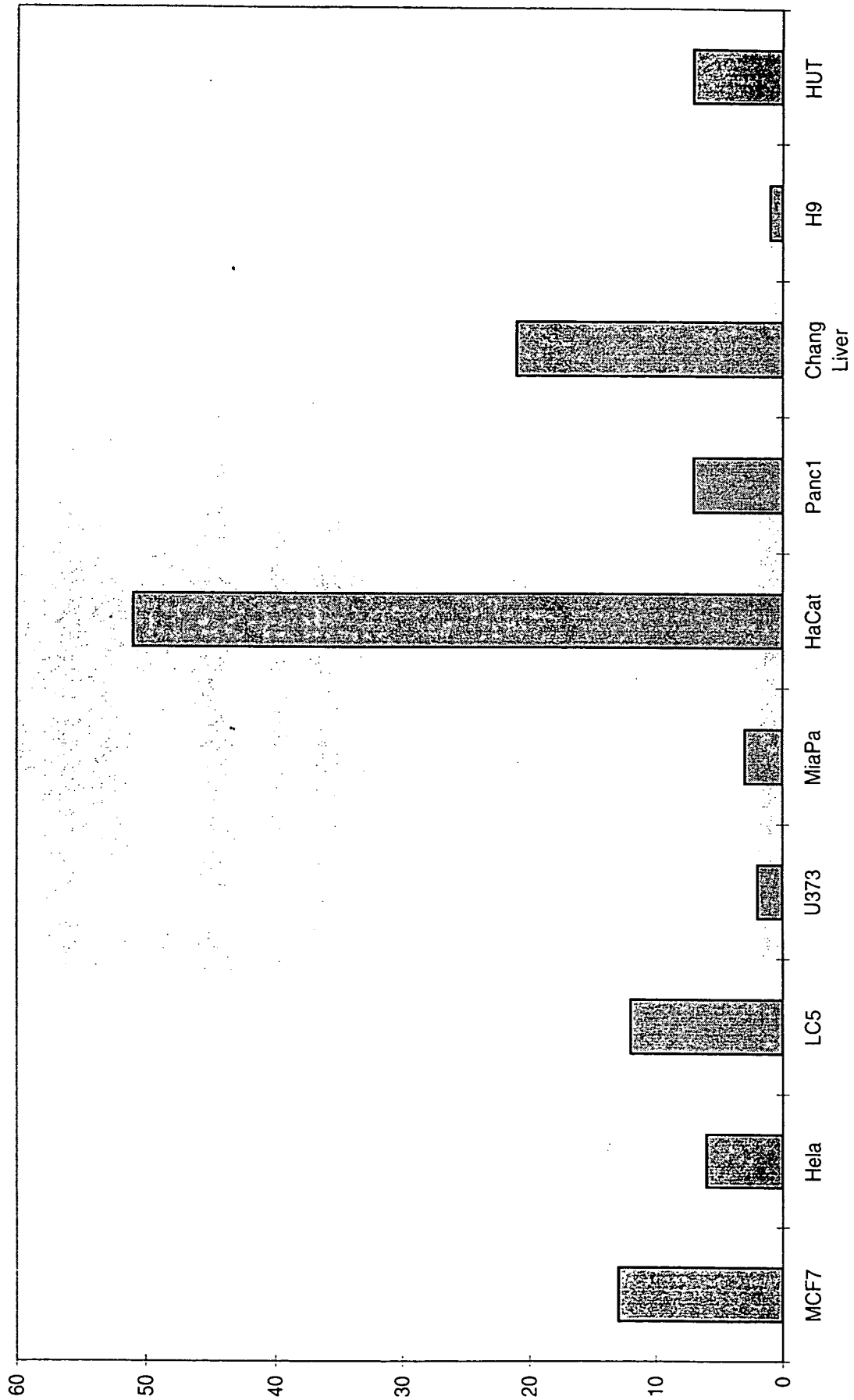
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HERV-L

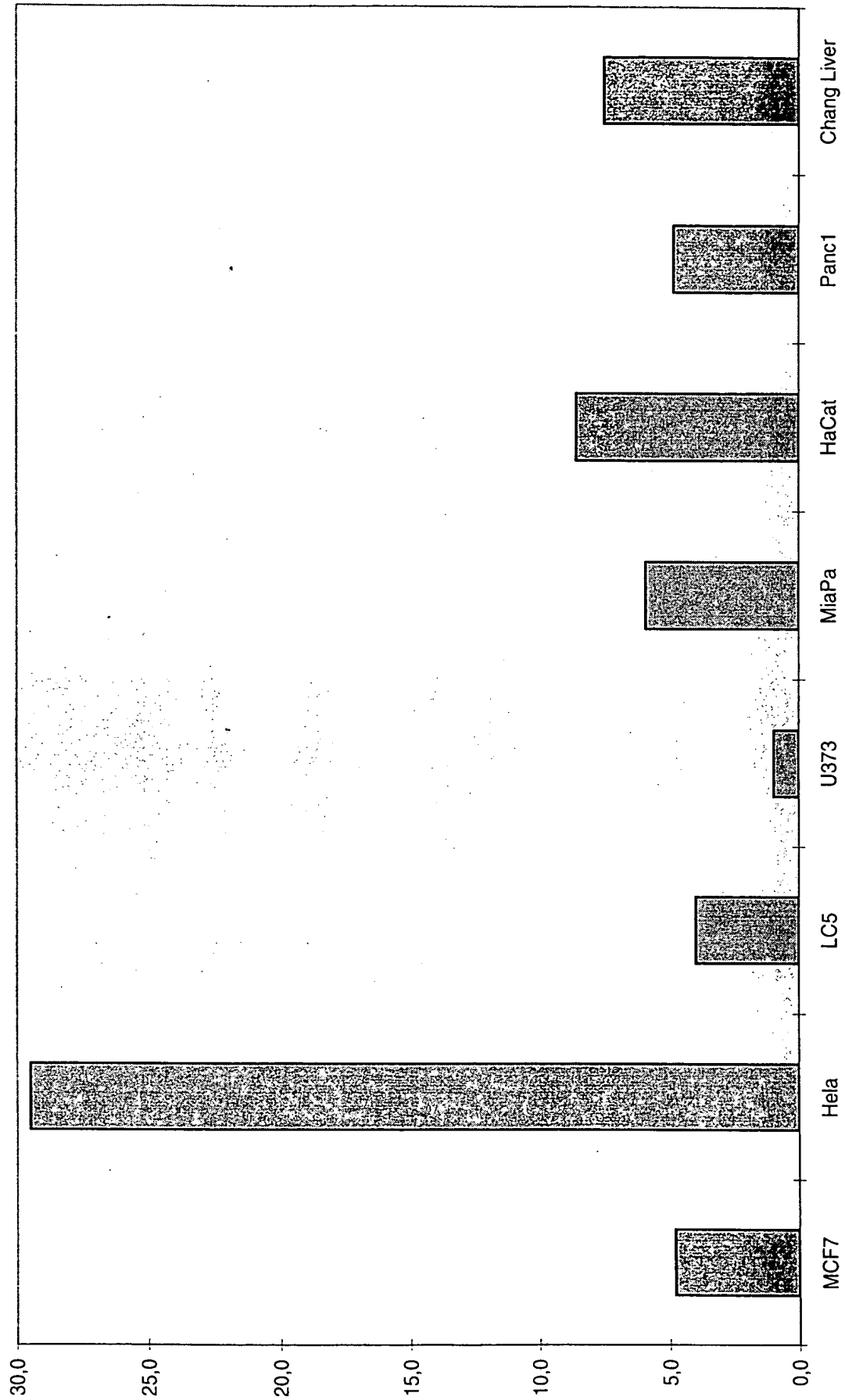
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HERV-K-T47D

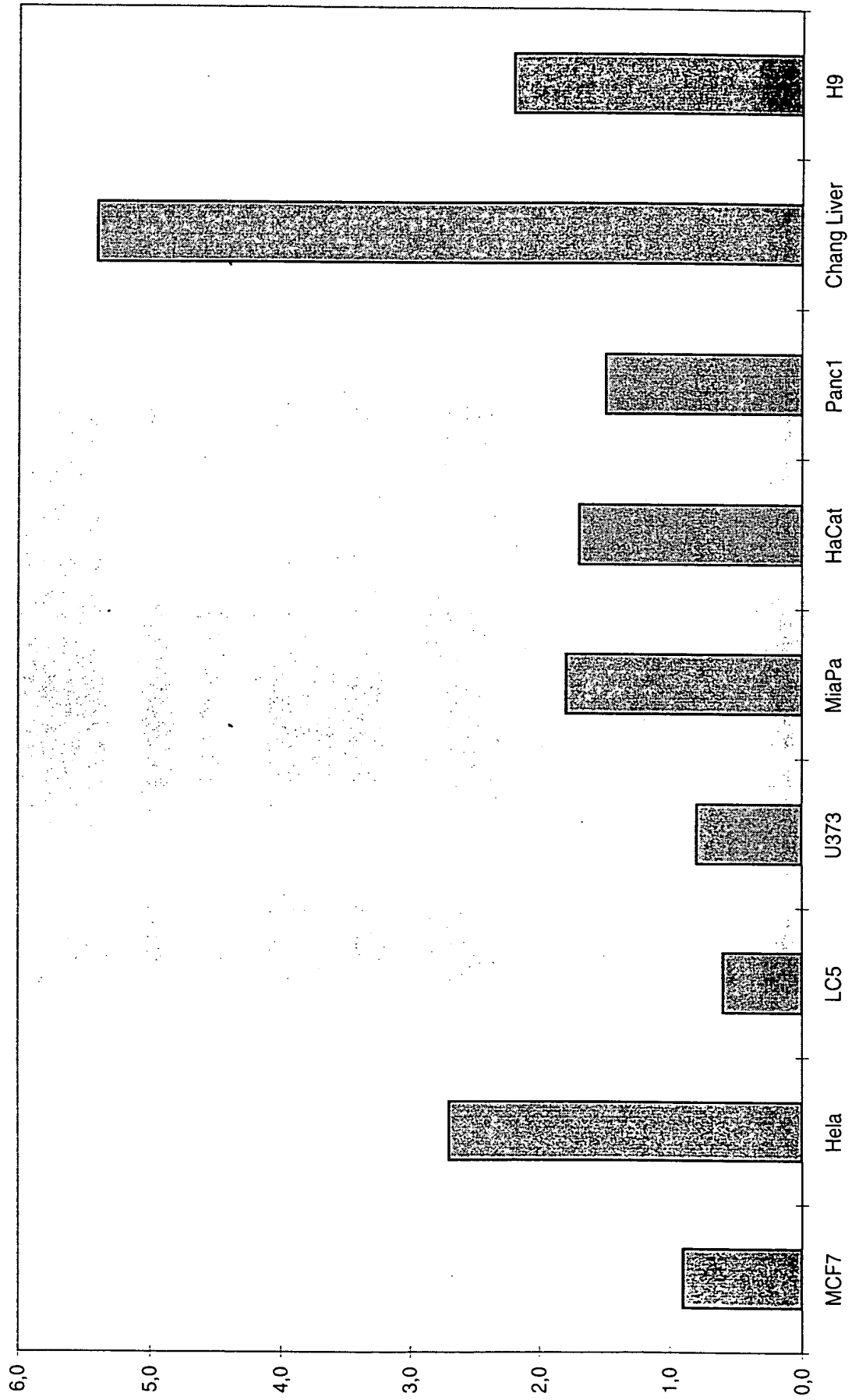
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HERV-T

Abb.2f)



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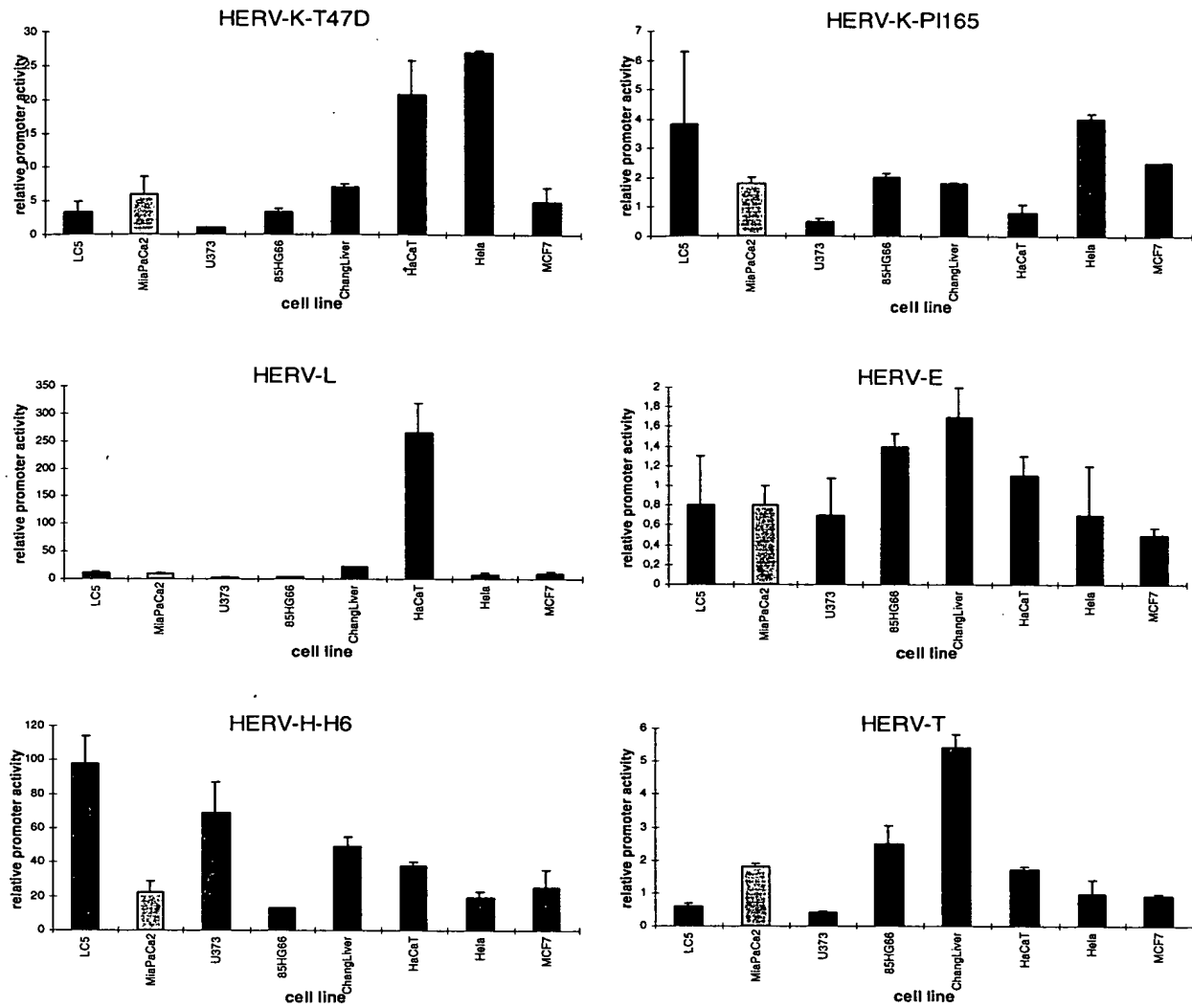
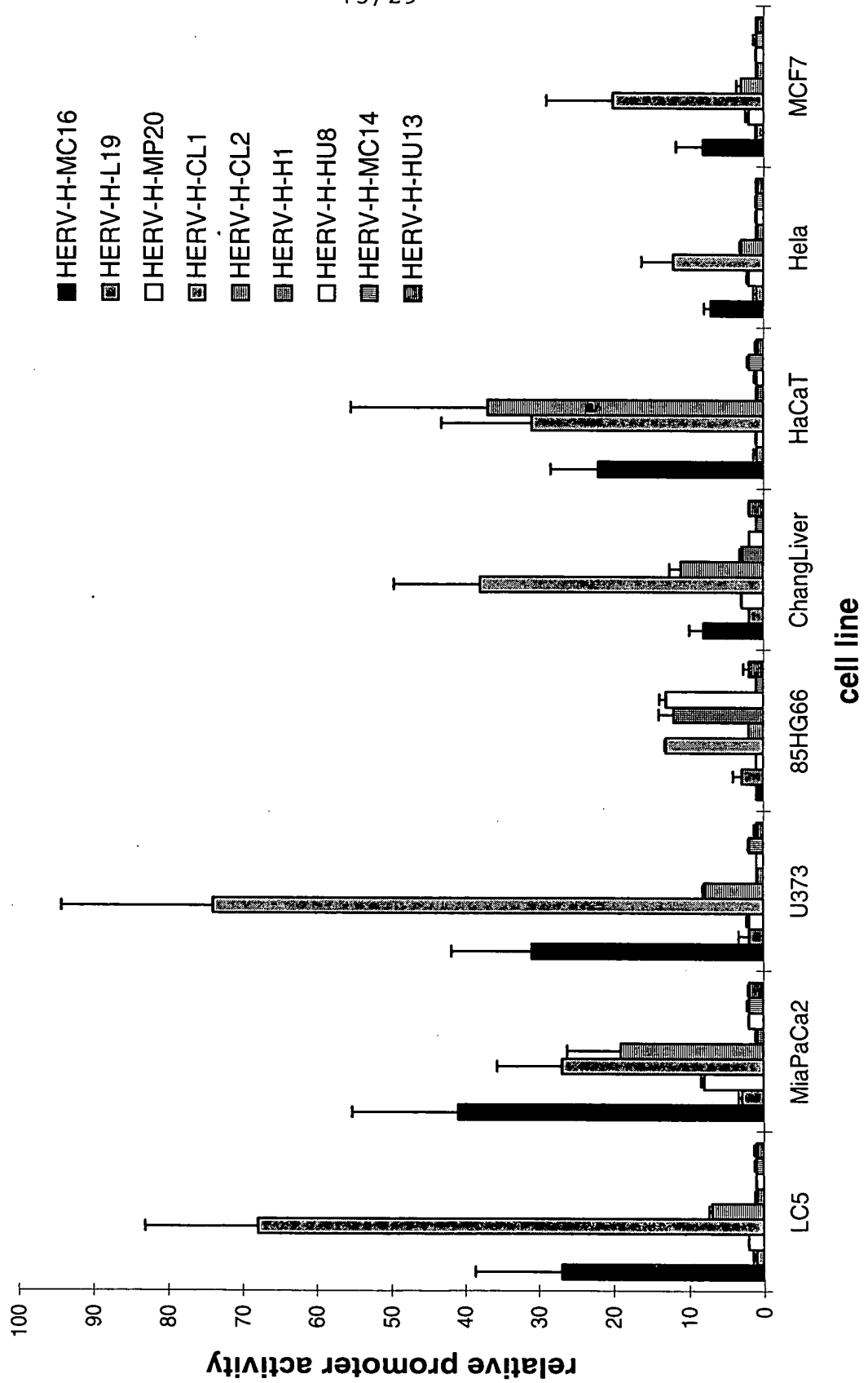
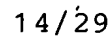


Abb. 2g: relative promoter activity of different HERV-LTRs in different cell lines

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Fig. 3a





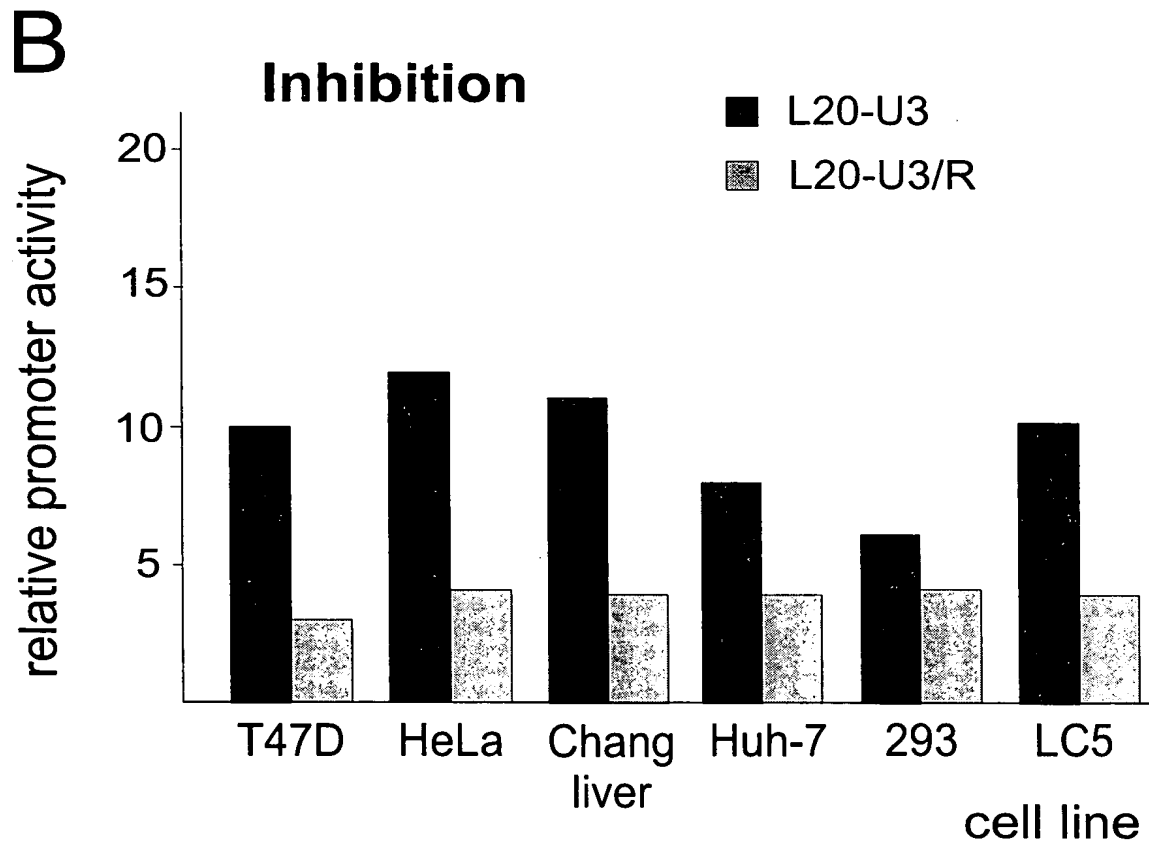
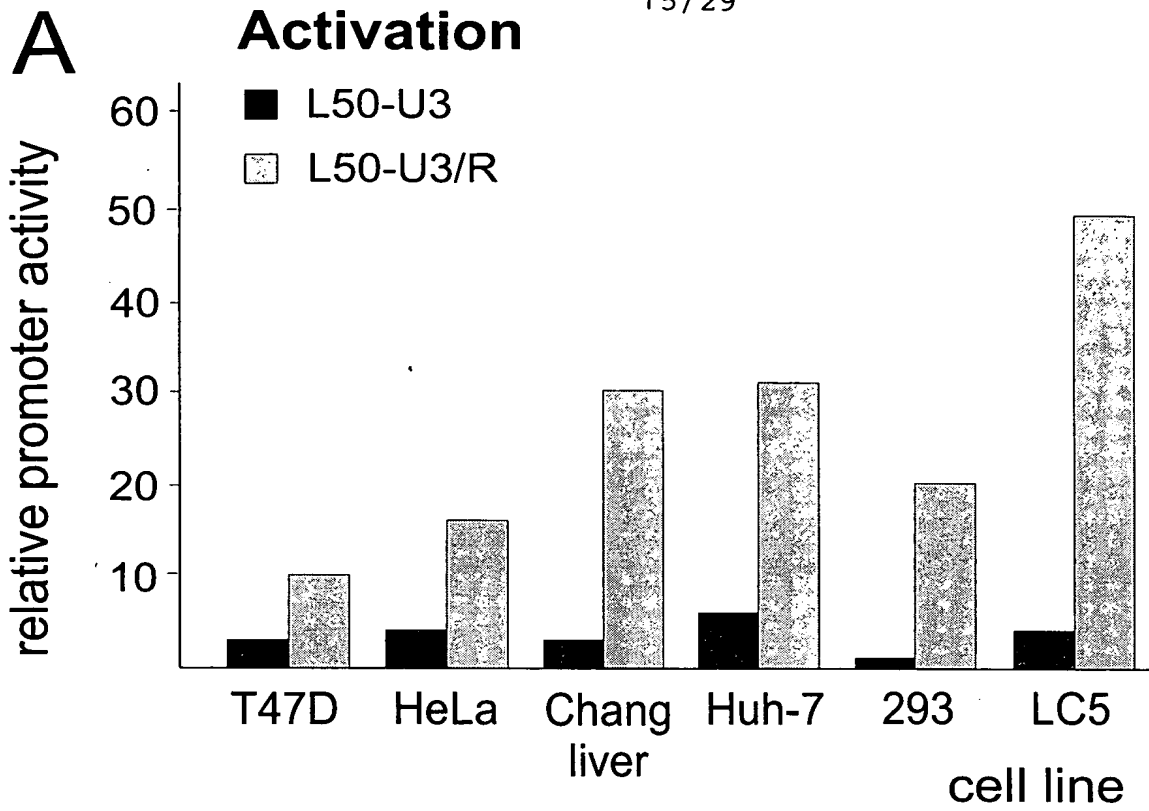


Fig. 4: LTR-R region modulates promoter activity of HERV-K-T47D related LTRs

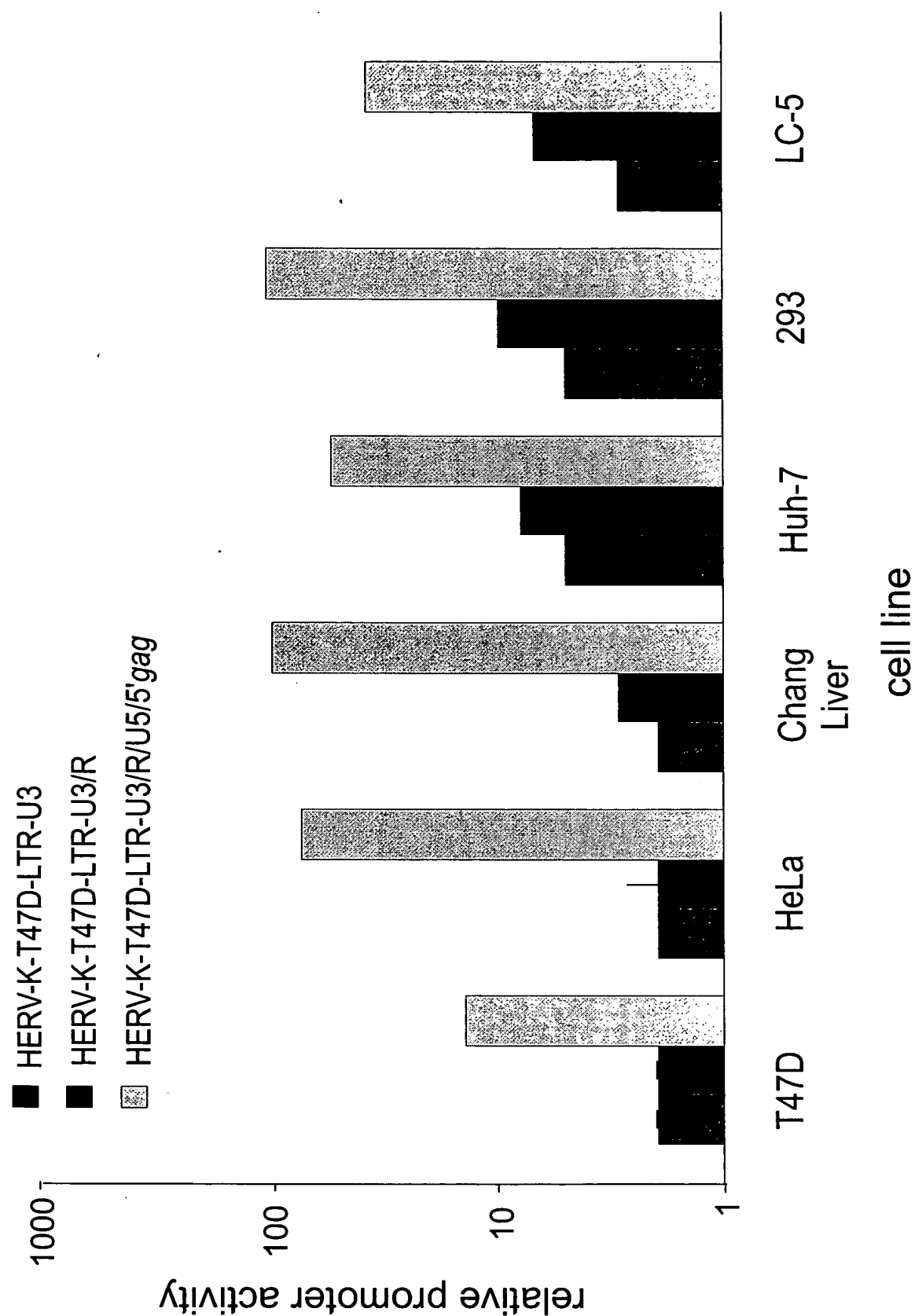


Fig. 5: Sequences downstream of LTR-R modulate promoter activity of HERV-K-T47D related LTRs

$$\begin{array}{c} \mathbb{R} \\ \updownarrow \\ \mathbb{U}_3 \end{array}$$

Inr

[illegible]

NF1 GR TFE3-S

[illegible]

AP-1 SP1 poly A

[illegible]
$$R \rightleftharpoons U5$$

HERV-K-T47D
L5
L50
L8

ACTTGGTGTAGTGGTACCTGGGCCCAGCGTGTTCCTTTA
T...GA.....CA..CC.....
T...GA.....CA..CC.....G..G..T..T.....
T...GG.....-C..CC.....C..G..T..C.....

Fig. 6: Regulatory elements in the R region of HERV-K-T47D LTRs

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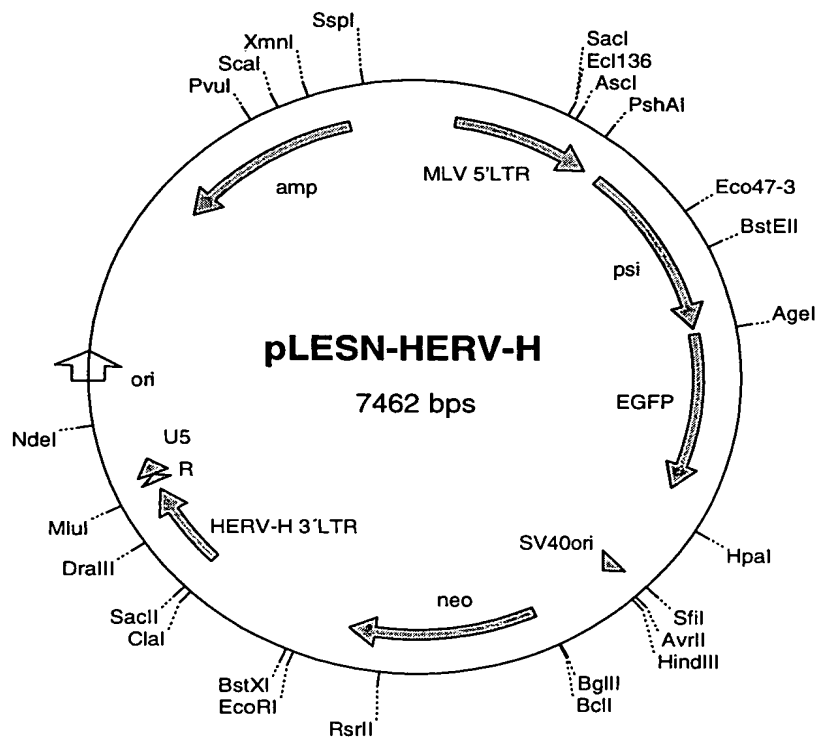
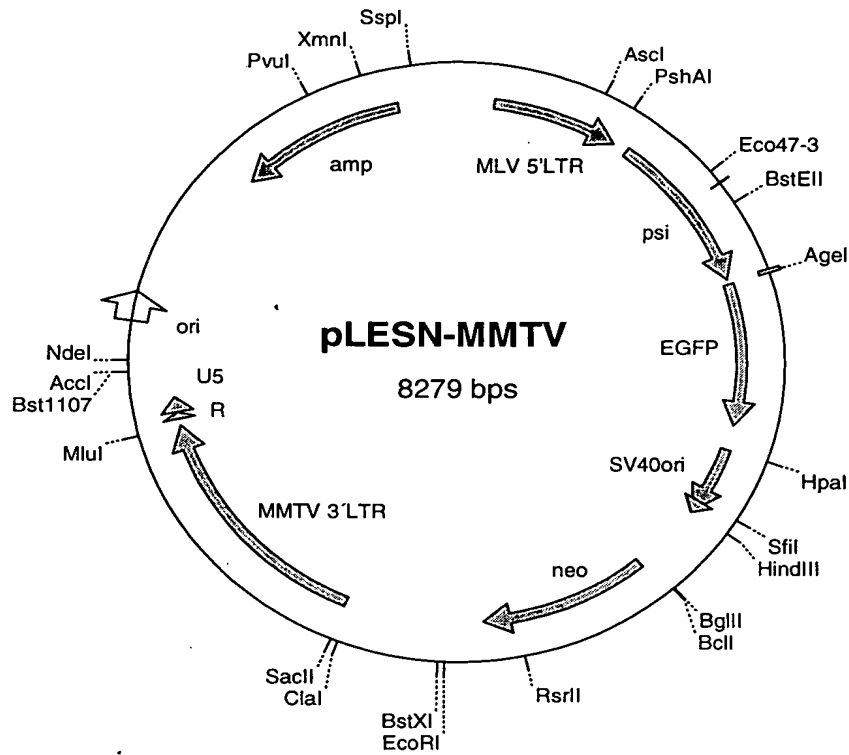


Fig.7: Retroviral ProCon vectors pLESN-MMTV and pLESN-HERV-H

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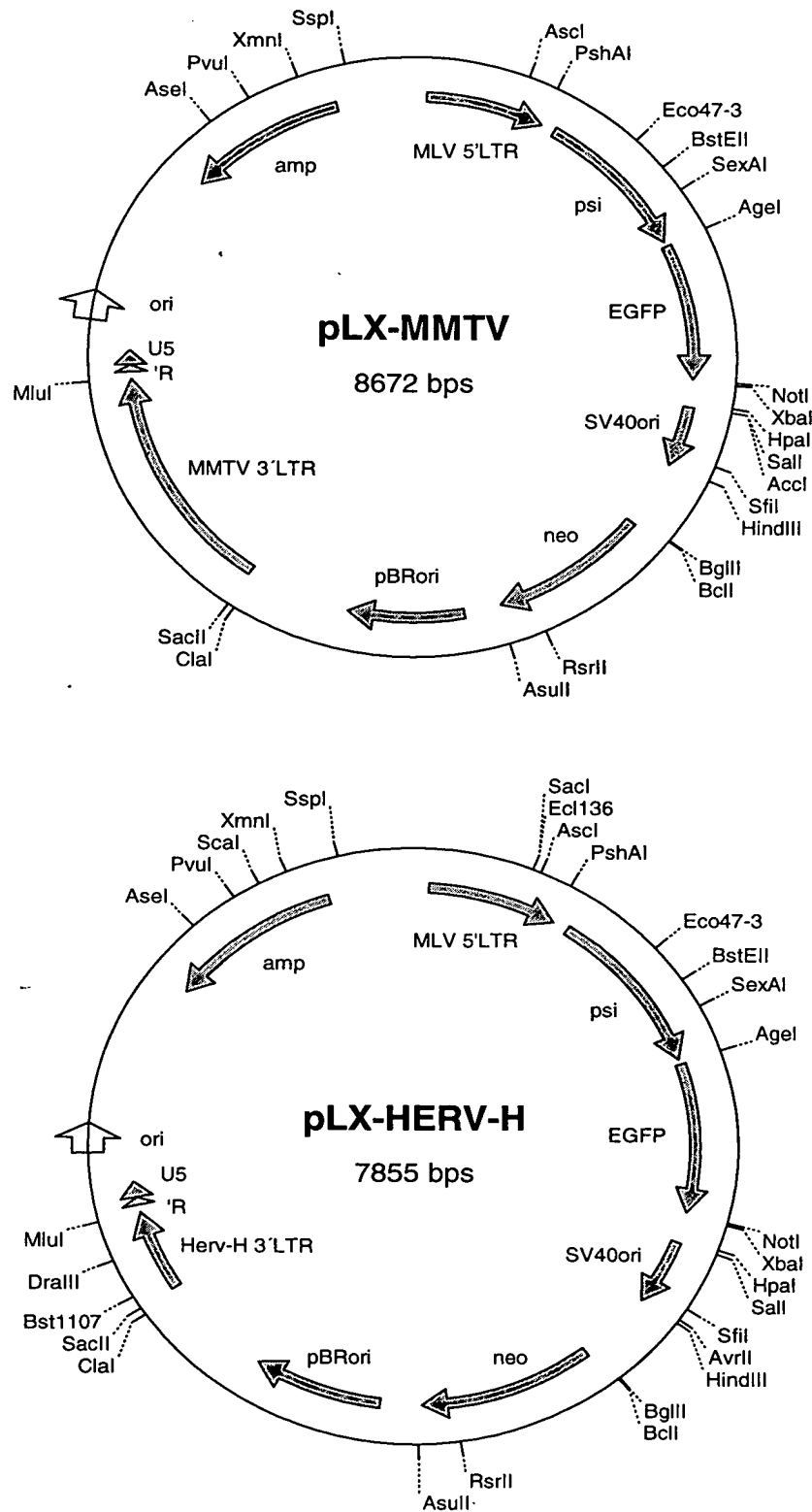
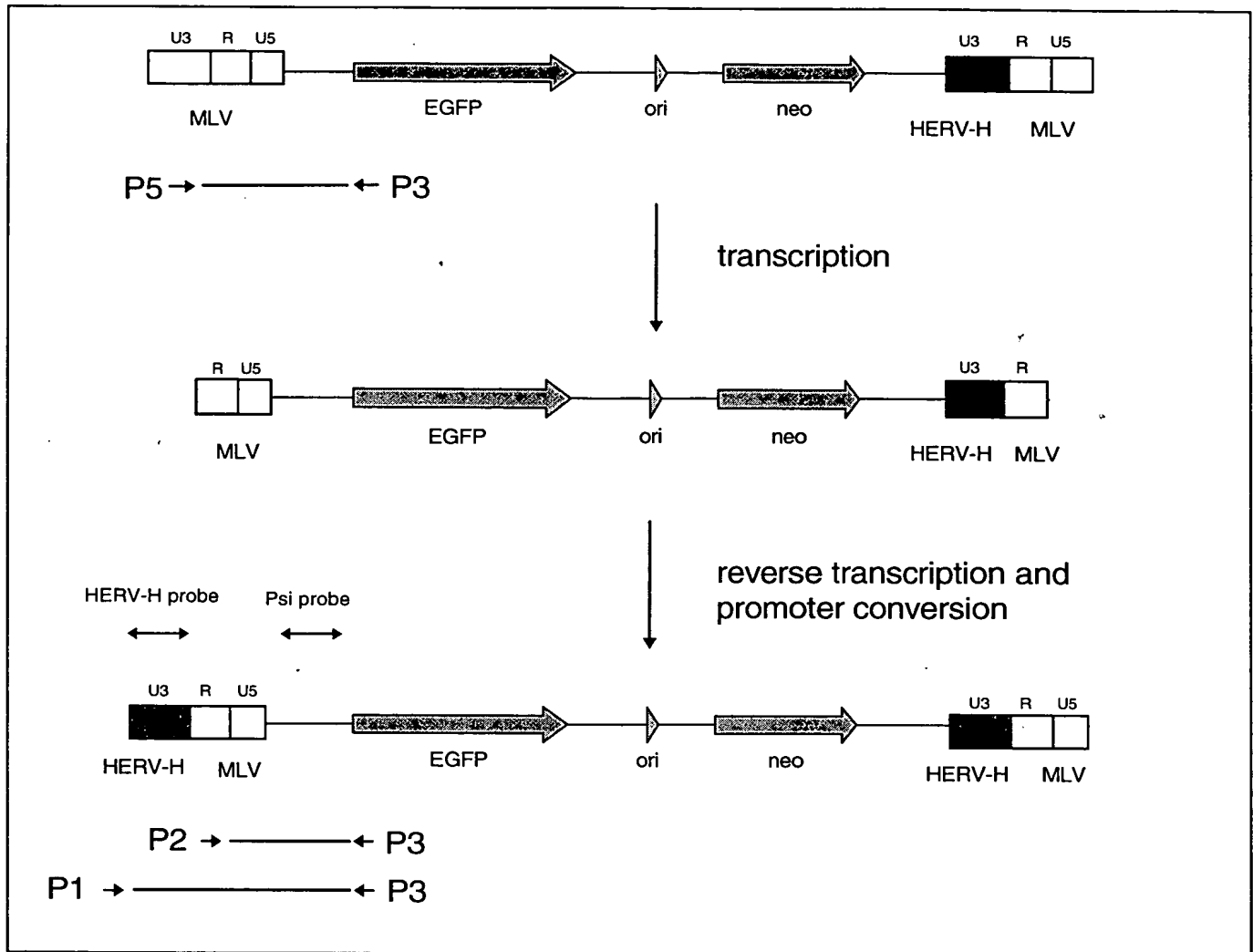


Fig.8: Retroviral ProCon vectors pLX-MMTV and pLX-HERV-H

a)

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b)

HERV-H probe

Psi probe

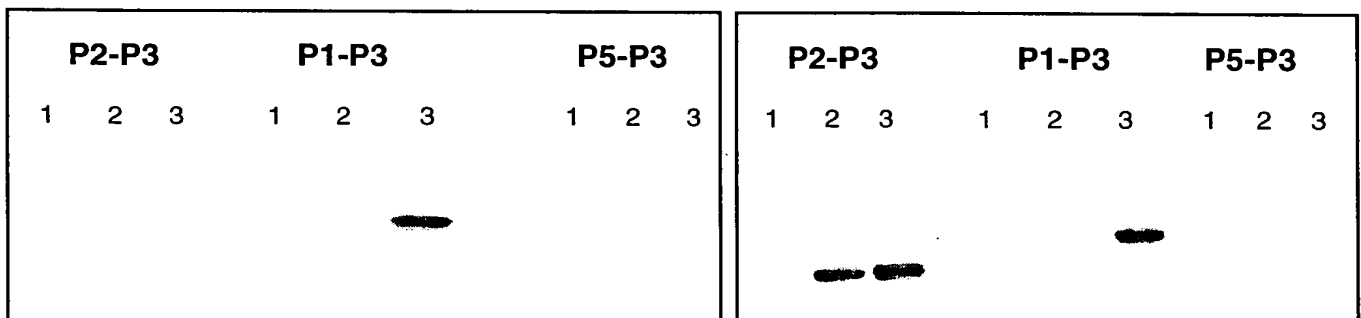
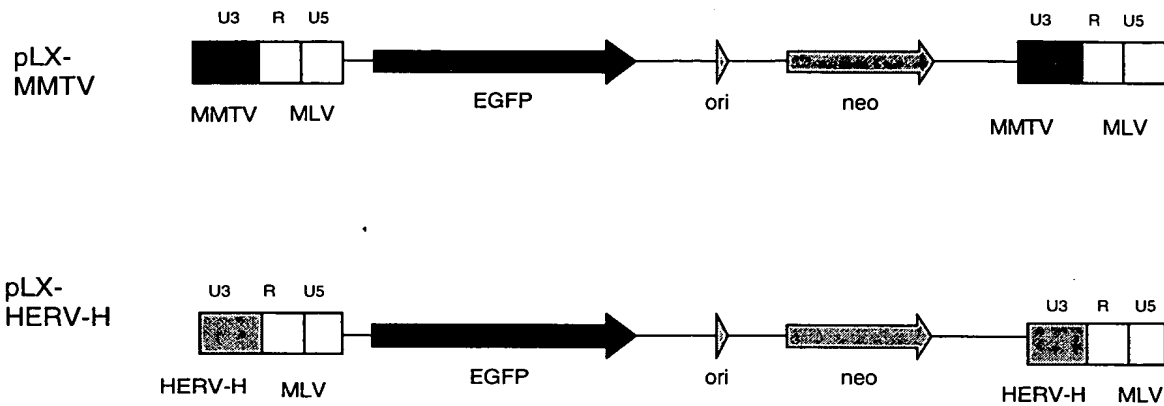


Fig. 9: a) Promoter conversion of the hybrid ProCon vectors

b) Demonstration of the correct promoter conversion with PCR and hybridization with a HERV-H and a psi probe (1:CK; 2:CK-pLX-MMTV; 3:CK-pLX-HERV-H)

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a)



b)

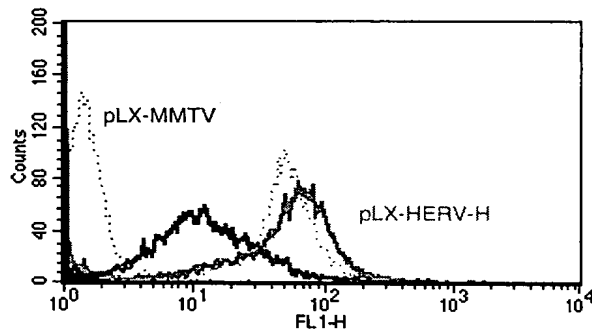
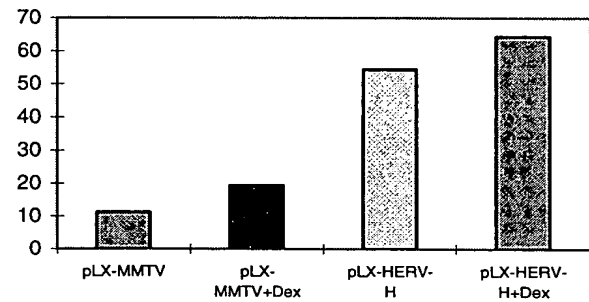
FACS-analyses**Mean fluorescence**

Fig.10: a) organization of the two ProCon vectors pLX-MMTV and pLX-HERV-H
 b) promoter activity of the HERV-H LTR in comparison to the MMTV-LTR by infection of CrfK cells

Appendix

A. HERV-H LTR sequences

	1				50
HERV-H L31	TGTCAGGCCT	CTGAGCCCAA	GCTAAGCCAT	CATATCCCCT	GTGACCTGCA
HERV-H HCM2	TGTCAGGCCT	CTGAGCCCAA	GCCAGGCCAT	CGCATCCCCT	GTGACTTGCA
HERV-H 19	TGTCAGGCCT	CTGAGCCCAA	GCTAAGCCAT	CATATCCCCT	GCGACCTGCA
HERV-H MP20	TGTCAGGCCT	CTGAGCCCAA	GCTAAGCCAT	CATATCCCCT	GTGACCTGCA
HERV-H CM3	TGTCAGGCCT	CTGAGCCCAA	GCCAAGCCAT	CGCATCCCCT	GTGACTTGCA
HERV-H MC16	TGTCAGGCCT	CTGAGCCCAA	GCC. ....	....	TGCA
HERV-H CM1	TGTCAGGCCT	CTGAGCCCAA	GCCAAGCCAT	CGCATCCCCT	GTGACTTGCA
HERV-H MP23	TGTCAGGCCT	CTGAGCCCAA	GCCAAGCCAT	CGCATCCCCT	GTGACTTGCA
HERV-H H13	TGTCAGGCCT	CTGAGCCCAA	GCTAAGCCAT	CATATCCCCA	GGGACCTGCA
HERV-H H1	TGTCAGGCCT	CTGAGCCCAA	GCTAAGCCAT	CAAATCCCCT	GTGACCTGCA
HERV-H HU8	TGTCAGGCCT	CTGAGCCCAA	GCTAAGCCAT	CATATCCC..	GTGACCTGCA
HERV-H PA7	TGTCAGGCCT	CTGAGCCCAA	GCTAAGCCAT	CAAATCCCCT	GTGACCTACA
	51				100
HERV-H L31	CGTATACATC	CAGATAGCC.	.....TGAAG	CAACTG....	.....
HERV-H HCM2	CGTATACATC	CAGATGGCC.	.....TAAAG	TAAGTGAAGA	.....TCCA
HERV-H 19	CATATACATC	CAGATGGCC.	.....TGAAG	TAAGTGAAGA	.....ATCA
HERV-H MP20	CGTACACATC	CAGATGGCCG	GTTCCCTGCCT	TAAGTGAAGA	CATTCCACCA
HERV-H CM3	CGTGTATGCC	CAGATGGCC.	.....TGAAG	TAAGTGAAGA	.....ATCA
HERV-H MC16	CGTATACATC	CAGATG....	.....AAG	CAAGTGAAGA	.....ATCA
HERV-H CM1	CGTATACGCC	CAGATGGCC.	.....TGAAG	TAAGTGAAGA	.....ATCA
HERV-H MP23	CGTATACGCC	CAGATGGCC.	.....TGAAG	TAAGTGAAGA	.....ATCA
HERV-H H13	CGTATACATC	CAGATGGCC.	.....TGAAG	CAAGTGAAGA	.....TCCA
HERV-H H1	CGTGTACATC	CAGATGACC.	.....TGAAG	CAAGTGAAGA	.....TCCA
HERV-H HU8	..TATACATC	CAGATGGCC.	.....TGAAG	CAAGTGAAGA	.....TCCA
HERV-H PA7	CGTGTACATC	CAGATGACC.	.....TGAAG	CAAGTGAAGA	.....TCCA
	101				150
HERV-H L31	.....T	AAAAATATCC	TTAACTGATG	ACA.....	..TTCCAATA
HERV-H HCM2	CAAAAGAAGT	AAAAACAGCC	TTAACTGATG	ACA.....	..TTCCAACA
HERV-H 19	CAAAAGAAGT	GAAAATGGCC	TGTTCC....	.....	.....
HERV-H MP20	CGAAAGAAGT	GAAAATGACC	TGTTCC....	.....	.....
HERV-H CM3	CAAAAGAAGT	GAAAAGGCC	TGCCCC....	.....	.....
HERV-H MC16	CAAAAGAAGT	GAAAATGGCC	GGTTCC....	.....	.....
HERV-H CM1	CAAAAGAAGT	GAAAAGGCC	TGCCCCGCCT	TAAGTGAAGA	CATTCCACCA
HERV-H MP23	CAAAAGAAGT	GAAAAGGCC	TGCCCCGCCT	TAAGTGAAGA	CATTCCACCA
HERV-H H13	CAAAGGAAGT	GAAAATAGCC	TTAACTGATG	ACA.....	..TTCCACCA
HERV-H H1	CAAAAGAAGT	GAAAGTAGCC	TTAACTGATG	ACA.....	..TTCCACCA
HERV-H HU8	CAAAAGAAGT	GAAAATAGCC	TTAACTGATG	ACA.....	..TTCCACCA
HERV-H PA7	CAAAAGAAGT	GAAAGTAGCC	TTAACTGATG	ACA.....	..TTCCACCA
	151				200
HERV-H L31	TTGTGATTTG	TTTCTGCCCT	ACCCTGACTG	ATCAATGTGC	TTTGTAATCT
HERV-H HCM2	TTGTGATTTG	TTCTTGCCCC	ACCCTAAGTG	ATAAATGTAC	TTTGTAATCT
HERV-H 19	.....	.....T	GCCTTAACTG	ATGACATTAC	CTTGTAATCT
HERV-H MP20	.....	.....T	GCCTTAACTG	ATGACATTGT	CTTGTAATCT
HERV-H CM3	.....	.....	ACCTTAACTG	AGTGATTAAAC	CCCATGAATT
HERV-H MC16	.....	.....T	GCCTTAACTG	ATGACATTAC	CTTGTAATCT
HERV-H CM1	TGGTGATTTG	TTCTTGCCCC	ACCTTAACTG	AGTGATTAAAC	CCTGTGAATT
HERV-H MP23	TGGTGATTTG	TTCTTGCCCC	ACCTTAACTG	AGTGATTAAAC	CCTGTGAATT
HERV-H H13	TTGTGATTTG	TTTCTGCCCT	ATCCTAAGTG	ATCAATGTAC	TTTGTAATCT
HERV-H H1	TTGTGATTTG	TTCTTGCCCC	ACGCTAAGTG	AT.....AC	CATATATTCT
HERV-H HU8	TTGTGATTTG	TTCTTGCCCC	ACGCTAAGTG	AT.....AC	CATATATTCT
HERV-H PA7	TTGTGATTTG	TTCTTGCCCC	ACGCTAGCTG	AT.....AC	CATATATTCT
	201				250
HERV-H L31	CCCCCACCCT	TCAGAAGGCT	CTTTGTAATC	CTCCCCACCC	TTGAGAATGG
HERV-H HCM2	CCCCCACCCT	TAAGAAGGTC	CTTTGTAATT	CTCCCCACCC	TTGAGAGTGT
HERV-H 19	TCCTTCTCCT	GGCTCATCCT	GGCTCAAAAG	CTC..CCGCA	CTGAG....C
HERV-H MP20	TCCTTCTCCT	GGCTCATCCT	GGCTCAAAAG	CTC..CCGCA	CTGAG....T
HERV-H CM3	TCCTTCTCCT	GGCTCAG...AAG	CTC..CCCCA	CTGAG....C
HERV-H MC16	TCCTTCTCCT	GGCTCAG...AAG	CTC..CCCCA	CTGAG....C

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HERV-H CM1	TGCTTCTCCT	GGCTCAG...AAG	CTC..CCCCA	CTGAG....C
HERV-H MP23	TGCTTCTCCT	GGCTCAG...AAG	CTC..CCCCA	CTGAG....C
HERV-H H13	CTCCCACCCT	TAAGAAGGTT	CTTTGTAATT	CTCCCCACCC	TTGAGAGTGT
HERV-H H1	TCCCC.....CGCCC	TTGAGAATGT
HERV-H HU8	TCCCC.....CGCCC	TTGAGAATGT
HERV-H PA7	TCCCC.....CGCCC	TTGAGAATGT

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HERV-H L31	ACTTGGTGAG	ATCCACCCCC	TGCCTGCAAA	GCATTGCCCC	TAACTCCACC
HERV-H HCM2	ACTTTGTGAG	ATCCACACCT	GCCCACCAGA	GAACAAACCC	CCTTTGACTG
HERV-H 19	ACCTTGTGAC	CCCTGCCTCT	GCCCGCCAGA	GAGCAACCCC	CTCTTGACTG
HERV-H MP20	ACATTGTGAC	CCCCACTCCT	GCCCGCCAGA	GAACAGCCCC	CT..TTGACTG
HERV-H CM3	ACCTTGTGAC	CCCTGCCCCCT	GCCCACCAGA	GAACAAACCC	CT..TTGACTG
HERV-H MC16	ACCTTGTGAC	CCCCACTCCT	GCCCGCCACA	GAACAAACCC	CT..TTGACTG
HERV-H CM1	ACCTTGTGAC	CCCCGCCCCCT	GCCCACCAGA	GAACAAACCC	CT..TTGACTG
HERV-H MP23	ACCTTGTGAC	CCCCGCCCCCT	GCCCACCAGA	GAACAGACCC	CT..TTGACTG
HERV-H H13	ACTTTGTGAG	ATCCACCCCC	TGCCGGCAAA	ACATTGCTCC	TAAACCAACC
HERV-H H1	ACTTTGTA..	.....	.....	.....	.....C
HERV-H HU8	ACTTTGTA..	.....	.....	.....	.....C
HERV-H PA7	ACTTTGTA..	.....	.....	.....	.....C

300

301

HERV-H L31	GCCTGTCCCA	AAACCTATGA	GAA..CTAATG	ATA.....	ATCCC.ACCA
HERV-H HCM2	TAATTTTCCA	TTACCTTCCC	TAATCCTATA	AAACGGCCCC	ACCCC.ATCT
HERV-H 19	TAATTTTCCCT	TTACCTACCT	AAATCCTATA	AAATGGCCCC	ACTCCTATCT
HERV-H MP20	TAATTTTCCCT	TTATCTACCC	AAATCCTATA	AAACAGCCCC	ACCTTTATCT
HERV-H CM3	TAATTTTCCA	TTACTTTCCC	AAATCCTATA	AAACGGCCCC	ACCCCTATCT
HERV-H MC16	TAATTTTCCA	CTGCCCCGCC	AAACCCCTATA	AAACGGTCCC	ACCCC.ATCT
HERV-H CM1	TAATTTTCCA	TTACCTTCCC	AAATCCTATA	AAACGGCCCC	ACCCCTATCT
HERV-H MP23	TAATTTTCCA	TTACCTTCCC	AAATCCTATA	AAACGGCCCC	ACCCCTATCT
HERV-H H13	GCCTA.CCCC	AAACCTGTAA	GAA..CTAATG	ATA.....	ATCC..ACCA
HERV-H H1	ACCTATCCC.	AAACCTATAA	GAA..CTAATG	ATA.....	ATCCT.ACCA
HERV-H HU8	ACCTATCCC.	AAACCTATAA	GAA..CTAATG	ATA.....	ATCC..ACCA
HERV-H PA7	ACCTATCCC.	AAACCTATAA	GAA..CTAATG	ATA.....	ATCCT.ACCA

350

351

HERV-H L31	CACTTTGCTG	ACTCTCTTTC	C...AGACTC	AGCCCGGCTG	CACCCAGGTG
HERV-H HCM2	CCCTTTGCTG	ACTCTCTTTT	C...GGACTC	AGCCCGCCTG	CACCCAGGTG
HERV-H 19	CCCTTCGCTG	ACTCTCTTTT	C...GGACTC	AGCCCGCCTG	TACCCAGGTG
HERV-H MP20	CCCTTGGCTG	ACTCTCTTTT	C...GGACTC	AGCCCGCCTG	CACCCAGGTG
HERV-H CM3	CCCTTCGCTG	ACTCTCTTTT	C...GGACTC	AGCCCGCCTG	CACCCAGGTG
HERV-H MC16	CCCTTCCCTG	ACTCTCTTTT	CTTCGGACTC	AGCCCGCCTG	CACCCAGGTG
HERV-H CM1	CCCTTCGCTG	ACTCTCTTTT	C...GGACTC	AGCCCGCCTG	CCCCCAGGTG
HERV-H MP23	CCCTTCGCTG	ACTCTCTTTT	C...GGACTC	AGCCCGCCTG	CCCCCAGGTG
HERV-H H13	CCCTTTGCTG	ACTC..TTTT	C...AGAATC	AGCCCGCCTG	CACCCAGGTG
HERV-H H1	CCCTTTGCTG	ACTCTCTTTT	T...GGACTC	AGCCCGCCTG	CACCCAGGTG
HERV-H HU8	CCCTTTGCTG	ACTCTCTTTT	T...GGACTC	AGCCCGCCTG	CACCCAGGTG
HERV-H PA7	CCCTTTGCTG	ACTCTCTTTT	T...GGACTC	AGCCCGCCTG	CACCCAGGTG

400

401

HERV-H L31	AAATAAACAG	CCATGTTGCT	CACAT
HERV-H HCM2	AAATAAACAG	CCATGTTGCT	CACAT
HERV-H 19	AAATAAACAG	CCATGTTGCT	CACAT
HERV-H MP20	AAATAAACAG	CCATGTTGCT	CACAT
HERV-H CM3	AAATAAACAG	CCATGTTGCT	CACAT
HERV-H MC16	AAATAAACAG	CCATGTTGCT	CACAT
HERV-H CM1	AAATAAACAG	CCATGTTGCT	CACAT
HERV-H MP23	AAATAAACAG	CCATGTTGCT	CACAT
HERV-H H13	AAATAAACAG	CCATGTTGCT	CACAT
HERV-H H1	AAATAAACAG	CCATGTTGCT	CACAT
HERV-H HU8	AAATAAACAG	CCATGTTGCT	CACAT
HERV-H PA7	AAATAAACAG	CCATGTTGCT	CACAT

425

B. HERV-W LTR sequences

	1				50
HERV-T47D-W2	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	AGCTGGATTT	CCTAGGCCGA
HERV-T47D-W4	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	AGCTGGATTT	CCTAGGCCGA
HERV-T47D-W5	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	ACCTGGATTT	CCTAGGCCGA
HERV-W1	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	AGCTGGATTT	CCTAGGCCAA
HERV-W10	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	AGCTGGATTC	CCTAGGCCGA
HERV-W11	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	AGTTGGATTT	CCTAGGCTGG
HERV-W18	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	AGTTGGATTT	CCTAGGCCGG
HERV-W2	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	AGCTGGATTT	CCTAGGCCAA
HERV-W22	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	AGCTGGATTT	CCTAGGCTGA
HERV-W23	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	AGCTGGATTT	CCTAGGCTGA
HERV-W4	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	AGTTGGATTT	CCTAGGCTGG
HERV-W5	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	ACCTGGATTT	CCTAGGCCAA
HERV-W6	TGTTGAGATG	GGGGACTGAG	AGACAGGACT	AGCTGGATTT	CCTAGGCCAA
HERV-W8	TGTTGAGATG	GGGGACTGAG	AAACAGGACT	AGCAGGATTT	CCTAGGCCGA
	51				100
HERV-T47D-W2	CTAAGAATCC	CTAAGCCTAG	CTGGGAAGGT	GACCGCATCC	ACCTTTAAAC
HERV-T47D-W4	CTAAGAATTC	CTAAGCCTAG	CTGGGAAGGT	GACCGCATCC	ATCTTTAAAC
HERV-T47D-W5	CTAAGAATCC	CTAAGCCTAG	CTGGGAAGGT	GACCACATCC	ACCTTTAAAC
HERV-W1	CTAAGAATCC	CTAAGCCTAG	CTGGGAAGGT	GACTACACCC	ACCTTTAAAC
HERV-W10	CTAAGAATCC	CTAAGCCTAG	CTGGGAAGGT	GACCACATCC	ACCTTTAAAC
HERV-W11	CTAAGAATCC	CTAAGCCTAG	CTGGGAAGGT	GACCACATCC	ACCTTTAAAC
HERV-W18	CTAAGAATCC	CTAAGCCTAG	CTGGGAAGGT	GACCACATCC	ACCTTTAAAC
HERV-W2	CTAAGAATCC	CTAAGCCTAG	CTGGGAAGGT	GACTACACCC	ACCTTTAAAC
HERV-W22	CTAAGAATCC	CTAAGCCTAG	CTGGGAAGGT	GACCGCATCC	ATCTTTAAAC
HERV-W23	CTAAGAATCC	CTAAGCCTAG	CTGGGAAGGT	GACTACACCC	ACCTTTAAAC
HERV-W4	CTAAGAATCC	CTAAGCCTAG	CTGGGAAGGT	GACCACATCC	ACCTTTAAAC
HERV-W5	CTAAGAATCT	CTAAGCCTAG	CTGGGAAGGT	GACCACATCC	ACCTTTAAAC
HERV-W6	CTAAGAATCC	CTAAGCCTAG	CTGGGAAGGT	GACTACACCC	ACCTTTAAAC
HERV-W8	TTAAGAATCC	CTAAGCCTAG	ATGGGAAGGT	GACCACATCC	ACCTTTAAAC
	101				150
HERV-T47D-W2	ACGGGGCTTG	CAACTTAGCT	CACACCCAAC	CAATCAGGTA	GTAAAGAGAG
HERV-T47D-W4	ATGGGGCTTG	CAACTTAACT	CATATCTGAC	CAATCAGGTA	GTAAAGAGAG
HERV-T47D-W5	ACAGGGCTTG	CAACTTAGCT	CACACTTGAC	CAGTCAGGTA	GTAAAGAGAG
HERV-W1	ATGGGGCTTG	CAACTTAGCT	CACACCCAAC	CAATCAGGTA	GTAAAGAGAG
HERV-W10	ACGGGGCTTG	CAACTTAGCT	CATACCCAAC	AAATCAGGTA	GTAAAGAGAG
HERV-W11	ACGGGGCTTG	CAATTTAGCT	CACACCCGAC	CAATCAGGTA	GTAAAGGAG
HERV-W18	ACGGGGCTTG	CAATTTAGCT	CACACCCGAC	CAATCAGGTA	GTAAAGGAG
HERV-W2	ACTAGGCTTG	CAACTTAGCT	CACACCCGAC	CAATCAGGTA	GTAAAGAGAG
HERV-W22	ATGGGGCTTG	CAACTTAACT	CATATCTGAC	CAATCAGGTA	GTAAAGAGAG
HERV-W23	ACTAGGCTTG	CAACTTAGCT	CACACCCGAC	CAATCAGGTA	GTAAAGAGAG
HERV-W4	ACGGGGCTTG	CAATTTAGCT	CACACCCGAC	CAATCAGGTA	GTAAAGGAG
HERV-W5	ACAGGGCTTG	CAACTTAGCT	CACACCCGAC	CCATCAGGTA	AGAAAGAGAG
HERV-W6	ACTAGGCTTG	CAACTTAGCT	CACACCCGAC	CAATCAGGTA	GTAAAGAGAG
HERV-W8	ACGGGGCTTG	CAACTCAGCT	CACACCCGAC	CCATCAGGTA	AGAAAGAGAG
	151				200
HERV-T47D-W2	CTCACTAAAA	TGCTAATTAG	GCAAAACAG	GAGGTAAAGA	AATAGCCAAT
HERV-T47D-W4	CTCACTAAAA	TGCTAATTAG	GCTAAAACAG	GAGGCAAAGA	AGTAGCCAAT
HERV-T47D-W5	CTCACTAAAA	TGCTAATTAG	GCTAAAACAG	GAGGTAAAGA	AATAGACAAT
HERV-W1	CTTGCTAAAA	TGCTAATTAG	GCAAAAACAG	GAGGTAAAGA	AATAGCCAGT
HERV-W10	CTCACTAAAA	TACTGATTAG	GCGAAAACAG	GAGGTAAAGGA	AACAGCCAGT
HERV-W11	CTCACTAAAA	TGCTAATTAG	GGAAAACAG	GAGGTAAAGA	AGTAGCCAAT
HERV-W18	CTCACTAAAA	TGCTAATTAG	GGAAAACAG	GAGGTAAAGA	AGTAGCCAAT
HERV-W2	CTTGCTAAAA	TGCTAATTAG	GCAAAAACAG	GAGGTAAAGA	AATAGCCAAT
HERV-W22	CTTGCTAAAA	TGCTAATTAG	GCAAAAACAG	GAGGTAAAGA	AATAGCCAGT
HERV-W23	CTTGCTAAAA	TGCTAATTAG	GCAAAAACAG	GAGGTAAAGA	AATAGCCAGT
HERV-W4	CTCACTAAAA	TGCTAATTAG	GGAAAACAG	GAGGTAAAGA	AGTAGCCAAT
HERV-W5	CCCGCTAAAA	TGCTAATTAG	GCAAAAACAG	GAGGTAAAGA	AATAGTCAAT
HERV-W6	CTTGCTAAAA	TGCTAATTAG	GCAAAAACAG	GAGGTAAAGA	AATAGCCAGT
HERV-W8	CCCGCTAAAA	TGCTAATTAG	GCAAAAACAG	GAGGTAAAGA	AATAGCCAAT

25/29

	201				250
HERV-T47D-W2	CATCTATTGC	CTGAGAGCAC	AGCAGGAGGG	ACAATGATCG	GGATATAAAC
HERV-T47D-W4	CATCTGTTGC	CTGACAGCAC	AGCAGGAGGG	ACAATGATCG	GGATATAAAC
HERV-T47D-W5	CATCTATCAC	CTGAGAGCAC	AGTGGGAGGG	ACAATGATCG	GCATA TAAAC
HERV-W1	CATCTATCGC	CTGACAGCAC	AAGGGGCGGG	ACAATGATCA	GGATATAAAC
HERV-W10	CATCTATCGC	CTGACAGCAC	AAGGGGCGGG	ACAATGATCA	GGATATAAAC
HERV-W11	CATCTATCGC	CTGAGAGCAC	AACAGGAGGG	ACAATGATCA	GGATATAAAC
HERV-W18	CATCTATCGC	CTGAGAGCAC	AACAGGAGGG	ACAATGATCA	GGATATAAAC
HERV-W2	CATCTATCGC	CTGAGAGCAC	AGCAGGAGGG	ACAATGATCC	GGATATAAAC
HERV-W22	CATCTATCGC	CTGACAGCAC	AAGGGGCGGG	ACAATGATCA	GGATATAAAC
HERV-W23	CATCTATCGC	CTGACAGCAC	AAGGGGCGGG	ACAATGATCA	GGATATAAAC
HERV-W4	CATCTATCGC	CTGAGAGCAC	AACAGGAGGG	ACAATGATCA	GGATATAAAC
HERV-W5	CATCTATTGC	CTGAGAGCAC	AGCGGGAGGG	ACAATGATCA	GGATATAAAC
HERV-W6	CATCTATCGC	CTGACAGCAC	AAGGGGCGGG	ACAATGATCA	GGATATAAAC
HERV-W8	CATCTATTGC	CTGAGAGCAC	AGCGGGAGGG	ACAATGATCA	GGATATAAAC
	251				300
HERV-T47D-W2	CCAAGTCTTC	GAGCCGGCAA	TGGCTACCTT	CTTTGGGTCC	CCTCCCCTTG
HERV-T47D-W4	CCAGGCATTC	GAGCCAGCTA	CAGCTACCCCT	CTTTGGGTCC	CCTCCCCTTG
HERV-T47D-W5	CCAGGCATTC	GAGCCAGCAA	CAGCAACCCC	CTTTGGG...	.....
HERV-W1	TCAGGCATTC	AAGCCAGCAA	TGGCTACCCA	CTTTGGGTCC	CCTCCCATT
HERV-W10	TCAGGCATTC	AAGCCAGCAA	TGGCTACCCA	CTTTGGGTCC	CCTCCCATT
HERV-W11	CCAGGCATTC	AAGCCAGCGG	TGGCTACCCCT	CTTTGGGTCC	CCTCCCCTTG
HERV-W18	CCAGGCATTC	AAGCCAGCGG	TGGCTACCCCT	CTTTGGGTCC	CCTCCCCTTG
HERV-W2	CCAAGCATTC	GAGCCAGCAA	TGGCTACCCCT	CTTTGTGTCC	CCTCCCCTTG
HERV-W22	TCAGGCATTC	AAGCCAGCAA	TGGCTACCCA	CTTTGGGTCC	CCTCCCATT
HERV-W23	TCAGGCATTC	AAGCCAGCAA	TGGCTACCCA	CTTTGGGTCC	CCTCCCATT
HERV-W4	CCAGGCATTC	AAGCCAGCGG	TGGCTACCCCT	CTTTGGGTCC	CCTCCCCTTG
HERV-W5	CCAGGCATTC	GAGCCGGCAA	CGACTACCCCT	CTTTGGGTCC	CCTCCCCTTG
HERV-W6	TCAGGCATTC	AAGCCAGCAA	TGGCTACCCA	CTTTGGGTCC	CCTCCCATT
HERV-W8	CCAGGCATTC	GAGCCGGCAA	CGACTACCCCT	CTTTGGGTCC	CCTCCCCTTG
	301				343
HERV-T47D-W2	TATGGGAGCT	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	C..
HERV-T47D-W4	TATGGGAGCT	CTGTCTTCAC	TCTATTAAAT	CTTGCAACTG	C..
HERV-T47D-W5	.....AGCT	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	C..
HERV-W1	TATGGGAGCT	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	CAA
HERV-W10	TATGGGAGCT	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	CAA
HERV-W11	TATGGGAGCC	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	CAA
HERV-W18	TATGGAAGCT	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	CAA
HERV-W2	TATGGGAGCT	CTATTTTCAC	TCTATTAAAT	CTTGCAACTG	CAA
HERV-W22	TATGGGAGCT	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	CAA
HERV-W23	TATGGGAGCT	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	CAA
HERV-W4	TATGGAAGCT	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	CAA
HERV-W5	TATGGGAGCT	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	CAA
HERV-W6	TATGGGAGCT	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	CAA
HERV-W8	TATGGGAGCT	CTGTTTTTCAC	TCTATTAAAT	CTTGCAACTG	CAA

C. HERV-K LTR sequences

	1.....50
HERV-K45	GCGACCGGT: GGATC:CCGG GCCCGCGG:T ACCGTCGACT :GCAGAATTC
HERV-K27	GCGACCGGT: GGATC:CCGG GCCCGCGG:T ACCGTCGACT :GCAGAATTC
HERV-K2	GCGACCGGT: GGATC:CCGG GCCCGCGG:T ACCGTCGACT :GCAGAATTC
HERV-K1	GCGACCGGT: GGATC:CCGG GCCCGCGG:T ACCGTCGACT :GCAGAATTC
HERV-K30	GTC CCACCTCCAG CCCTAAGGCG GTTTTTCCT ATCTCAGTAG
HERV-K10	AGTAG
	51.....100
HERV-K45	ATGGAGCATA CAATCGGGTT TTATACCGAG ACATTCCATT GCCCAGGGAC
HERV-K27	ATGGAGCATA CAATCGGGTT TTATACCGAG ACATTCCATT GCCCAGGGAC
HERV-K2	ATGGAGCATA CAATCGGGTT TTATACCGAG ACATTCCATT GCCCAGGGAC
HERV-K1	ATGGAGCATA CAATCGGGTT TTATACCGAG ACATTCCATT GCCCAGGGAC
HERV-K30	ATGGAGCATA CAATCGGGTT TTATACCGAG ACATTCCATT GCCCAGGGAC
HERV-K10	ATGGAGCATA CAATCGGGTT TTATACCGAG ACATTCCATT GCCCAGGGAC
	101.....150
HERV-K45	AGGCAGGAGA CAGATGCCTT CCTCTTGTCT CAACTGCAAG AGGCATTTCCT
HERV-K27	AGGCAGGAGA CAGATGCCTT CCTCTTGTCT CAACTGCAAG AGGCATTTCCT
HERV-K2	AGGCAGGAGA CAGATGCCTT CCTCTTGTCT CAACTGCAAG AGGCATTTCCT
HERV-K1	AGGCAGGAGA CAGATGCCTT CCTCTTGTCT CAACTGCAAG AGGCATTTCCT
HERV-K30	AGGCAGGAGA CAGATGCCTT CCTCTTGTCT CAACTGCAAG AGGCATTTCCT
HERV-K10	AGGCAGGAGA CAGATGCCTT CCTCTTGTCT CAACTGCAAG AGGCATTTCCT
	151.....200
HERV-K45	TCCTCTTATA CTAATCCTCC TCAGCACAGA CCCTTTACGG GTGTCGGGCT
HERV-K27	TCCTCTTATA CTAATCCTCC TCAGCACAGA CCCTTTACGG GTGTCGGGCT
HERV-K2	TCCTCTTATA CTAATCCTCC TCAGCACAGA CCCTTTACGG GTGTCGGGCT
HERV-K1	TCCTCTTATA CTAATCCTCC TCAGCACAGA CCCTTTACGG GTGTCGGGCT
HERV-K30	TCCTCTTATA CTAATCCTCC TCAGCACAGA CCCTTTACGG GTGTCGGGCT
HERV-K10	TCCTCTTTTA CTAATCCTCC TCAGCACAGA CCCTTTACAG GTGTCGGGCT
	201.....250
HERV-K45	GGGGGACGGT CAGGTCTTTC CCTTCCCACG AGGCCATATT TCAGACTATC
HERV-K27	GGGGGACGGT CAGGTCTTTC CCTTCCCACG AGGCCATATT TCAGACTATC
HERV-K2	GGGGGATGGT CAGGTCTTTC CCTTCCCACG AGGCCATATT TCAGACTATC
HERV-K1	GGGGGACGGT CAGGTCTTTC CCTTCCCACG AGGCCATATT TCAGACTATC
HERV-K30	GGGGGACGGT CAGGTCTTTC CCTTCCCACG AGGCCATATT TCAGACTATC
HERV-K10	GGGGGACGGT CAGGTCTTTC CCTTCCCACG AGGCCATATT TCAGACTATC
	251.....300
HERV-K45	ACATGGGGAG AAACCTTGGA CAATACCTGG CTTTCCTAGG CAGAGGTCCC
HERV-K27	ACATGGGGAG AAACCTTGGA CAATACCTGG CTTTCCTAGG CAGAGGTCCC
HERV-K2	ACATGGGAAG AAACCTTGGA CAATACCTGG CTTTCCTAGG CAGAGGTCCC
HERV-K1	ACATGGGGAG AAACCTTGGA CAATACCTGG CTTTCCTAGG CAGAGGTCCC
HERV-K30	ACATGGGGAG AAACCTTGGA CAATACCTGG CTTTCCTAGG CAGAGGTCCC
HERV-K10	ACATGGGGAG AAACCTTGGA CAATACCTGG CTTTCCTAGG CAGAGGTCCC
	301.....350
HERV-K45	TGCGGCCTTC CGCAGTTTTT GTGT:CCTGG GTACTTGAGA TTAGGGAGTG
HERV-K27	TGCGGCCTTC CGCAGTTTTT GTGT:CCTGG GTACTTGAGA TTAGGGAGTG
HERV-K2	TGCGGCCTTC CGCAGTTTTT GTGT:CCTGG GTACTTGAGA TTAGGGAGTG
HERV-K1	TGCGGCCTTC CGCAGTTTTT GTGT:CCTGG GTACTTGAGA TTAGGGAGTG
HERV-K30	TGCGGCCTTC CGCAGTTTTT GTGTCC:TGG GTACTTGAGA TTAGGGAGTG
HERV-K10	TGCGGCCTTC TGCAGTTTTT GTGTCCCTGG GTACTTGAGA TTAGGGAGTG
	351.....400
HERV-K45	GTGATGACTC TTAAGGAGCA TGCTGCCTTC AAGCATCTGT TTAACAAAGC
HERV-K27	GTGATGACTC TTAAGGAGCA TGCTGCCTTC AAGCATCTGT TTAACAAAGC
HERV-K2	GTGATGACTC TTAAGGAGCA TGCTGCCTTC AAGCATCTGT TTAACAAAGC
HERV-K1	GTGATGACTC TTAAGGAGCA TGCTGCCTTC AAGCATCTGT TTAACAAAGC
HERV-K30	GTGATGACTC TTAAGGAGCA TGCTGCCTTC AAGCATCTGT TTAACAAAGC
HERV-K10	GTGATGACTC TTAAGGAGCA TGCTGCCTTC AAGCATCTGT TTAACAAAGC

27/29

401.....450
HERV-K45 ACATCCTGCA CCGCCCTTAA TCCATTCAAC CCTGAGTTGA CACAGCACAC
HERV-K27 ACATCCTGCA CCGCCCTTAA TCCATTCAAC CCTGAGTTGA CACAGCACAC
HERV-K2 ACATCCTGCA CTGCCCTTAA TCCATTCAAC CCTGAGTTGA CACAGCGCAC
HERV-K1 ACATCCTGCA CCGCCCTTAA TCCATTCAAC CCTGAGTTGA CACAGCACAC
HERV-K30 ACATCCTGCA CCGCCCTTAA TCCATTCAAC CCTGAGTTGA CACAGCACAC
HERV-K10 ACATCCTGCA CCGCCCTTAA TCCATTCAAC CCTGAGTTGA CACAGCAT

451.....550
HERV-K45 GTTTCAGAGA GCACGGGGTT GGGGGTAAGG TCATAGATTA ACAGAATCTC
HERV-K27 GTTTCAGAGA GCACGGGGTT GGGGGTAAGG TCATAGATTA ACAGAATCTC
HERV-K2 GTTTCAGAGA GCACGGGGTT GGGGGTAAGG TCATAGATTA ACAGAATCTC
HERV-K1 GTTTCAGAGA GCACGGGGTT GGGGGTAAGG TCATAGATTA ACAGAATCTC
HERV-K30 GTTTCAGAGA GCACGGGGTT GGGGGTAAGG TCATAGATTA ACAGAATCTC
HERV-K10 GTTTCAGAGA GCACGGGGTT GGGGGTAAGG TCATAGATTA ACAGAATCTC

501.....550
HERV-K45 AAGGCAGAAG AATTTTTCTT AACACATAAC AAAATGGAGT CTCCCATGTC
HERV-K27 AAGGCAGAAG AATTTTTCTT AACACATAAC AAAATGGAGT CTCCCATGTC
HERV-K2 AAGGCAGAAG AATTTTTCTT AACACATAAC AAAATGGAGT CTCCCATGTC
HERV-K1 AAGGCAGAAG AATTTTTCTT AACACATAAC AAAATGGAGT CTCCCATGTC
HERV-K30 AAGGCAGAAG AATTTTTCTT AACACATAAC AAAATGGAGT CTCCCATGTC
HERV-K10 AAGGCAGAAG AATTTTTCTT AGCACATAAC AAAATGGAGT CTCCTATGTC

551.....600
HERV-K45 TACTTCTTTC TACACAGACA CAGTAACAAT CTGATCTCTC TTGCTTTTCC
HERV-K27 TACTTCTTTC TACACAGACA CAGTAACAAT CTGATCTCTC TTGCTTTTCC
HERV-K2 TACTTCTTTC TACACAGACA CAGTAACAAT CTGATCTCTC TTGCTTTTCC
HERV-K1 TACTTCTTTC TACACAGACA CAGTAACAAT CTGATCTCTC TTGCTTTTCC
HERV-K30 TACTTCTTTC TACACAGACA CAGTAACAAT CTGATCCCTC TTGCTTTTCC
HERV-K10 TACTTCTTTC TACACAGACA CAGTAACAAT TTGATCTCTC TTGCTTTTCC

601.....650
HERV-K45 CCACATTTCC CCCTTTTCTT TTCG
HERV-K27 CCACATTTCC CCCTTTTCTT TTCGA
HERV-K2 CCACATTTCC CCCTTTTCTT TTCGACAAA
HERV-K1 CCACATTTCC CCCTTTTCTT TTCGACAAAA CCGCCAT:CT CGAGATC:TG
HERV-K30 CCACATTTCC CCCTTTTCTT ATCCATCACA CTGGCGGCCG CTCGAGCATG
HERV-K10 CCACATTTCC CCCTTTTCTT TTCGACAAAA CCGCCATC

651.....
HERV-K1 AGT
HERV-K30 CATCTAGAGG GCCCAATTCTG CCCTATAGTG

HERV-K-T47D-5'LTR

TGTGGGCGAAGGATTACCCAGGTGCCGAGGCAAGAGACTGAAGGCACAACTGTTTCAGTATAATATAGAAAATAGCTAG
 AATAAGAATAGTTATAATAAAAAATTAGATATACACATGATCATGGACATTACCAATCATTACTACAAACATTGTTAATCA
 TTAGCTTTTAAATATTACTCTTTGTTTATTACTAATATAACCAAGGAATAACCGGTAGCATACGGTCAGGTGCTGAAGGG
 ACATTGTGAGAAGTGACCTAGAAGGCAAGAGGTGAGCCTTCTGTACGCCTGCATAAGGACAGCTTGAGGGCTCCTTGGT
 CAAGCTGTAACACCAGTGCCCTGGGAAGGCACCGTTACTTAGCAGACCATGAAAGGGAGTCTCCATTCTTGGAGGAGTCA
 GGGAAACACTATGCTCCACCAGCTTCTTGTGTATCCAGCCCTGCCCACAGTCATCCAGAGGCATAAAACCCCTCCCTGTGG
 TGCTGTGCTTCAATGGCCATGCTTCTTGTCCACTTTCATGTTTCTCTGTACTCTGTGTTTCTCTTTGAAGTTCGTAGAA
 GATAATGGTAGAAGAAATAGTGAAAGTCTTTGATCTTTCTTATAAGTGCATAGAAGAAAACACTGATGTATGCCCTGCCCTT
 CCCTCTCTGCTTCAGCTACCTAAAAGGAAAGGCCCCCTTTCCCATGATCACATGACTTGCCCTGACCTTATCAATCACTTG
 GAGGACTCACCTCCTTACCCTGTCCCTTTGTCTTGTATGCAATAAATATCAGCACGCCAGCCATTCCGGGGCCACTACT
 GGTCTCCGCAACTTGGTGAGTGGTACCCTGGGCCAGCTGTTTTCTCTTTATCTCTTTTGTCTTGTGTCTTTATTCTTCT
 TACAATCTCTCATCTCTGCACATGGGGAGAACACCGGCAAGCCCGTAGGGCTGGACCTTACA

L48-LTR (U3-R)

TGTGGGCGGAAGAGTACCTAGGTGCCGAGGCAAGAGACTGAAGGCACAACTGTTTCAGTATAATAAAGAAAATAGAATA
 AGAATAGTCATAATACAAATTAGATACAGCGATGATCATGAACAATTATCCATCATTATTATAAACATTATTAATCATT
 GCTTTTAAATATTACTCTGTTGCATTAATAATATAACCTAGGAATAACCGGCAGGTATAGGGTCAGGTGCTGAAGGGACAT
 TGTGAGAAGTGAATAGAAGGCAAGAGGGGAGCCTTCTGTCTATGCCCCGATAAGGGCCGCTTGAGGGCCCCCTTGGTCAAGC
 GGTAACGCCAGTGTCTGGGAAGGCACCCGTTACTGAGCAGACCGGGAAGGGAGTCTCCTTTTCTTGGAGGAGTCAGGGA
 ACGCTCTGCTCCACCAGCTTCTTGTGGGAGGCTGGATGTTACCCAGGCCTGCCTGCAGTCATCCGGAGGCCCTGAACCCCT
 CCCTGTGGTGCTTCAATGGTCACGTTCCCTTGTCCACTTTCATGCTCCTTCCGTACTCCTGGTTCCCTCTTTGAAGTTCGTA
 GTAGATAGCGGTAGAAGAAAATAGTGAAAGTCTTAAAGTCTTTGATCTTTATAAGTTTCATAGAAGAAAACGCTGATGCCTGC
 CGCCTTCTCTCTCTGCTTCAGCTACCTAAGAGGGAAGGGCCGCTGTCTGTGATCAGGTGACTTGCTTCACCTTGTCAA
 TCACTTAGAAGACTGACCCCTCCTTATCCTGCCCCCTTGTCTTGTATGCAATAAATATCAGCGAGCCCAGCCGTTACGGGC
 CACTACCGGTCTCCGTGCTCTTGTGGTAGTGGTCCCCGGGCCAGCTGTTTTCTCTTT

L5-LTR (U3-R)

TGTGGGTGGAGGATTACCCAGGTGCCAAGGCAAGAGACTGAAGGCACAACTGTTTCAGTATAATAAAAAAATAGAATA
 AGAATAGTCATAATACAAATTAGATATAGAGATGATCATGGACAATTAGCAATCACTATTAATCTTTAGCTTTTAAATATT
 ACTCTTTGTTGCATTACTAATATAACCTAGGAATAACCGGTGGGTATAGGGTCAGGTGCTGAAGGGACATTGTGTGAAGT
 GACCTGGAAGGCAAGAGGTGAGCCCTCTGTACGCCCCACATAAGGGCCGCTTGAGGGCTCCTTGGTCAAGTGGTAACGCC
 AGTGTCTGGGAATGCACCCGTTAATTAGCAGACCGCGAAAGGGAGTCTCCTTTCTTGGAAAGAGTTGGGGAACACTCTGC
 TCCACCAGCTTCTTGTGGAAGGCTGGATATTATCCAGGCCTGCGCGCAGTCATCCGGAGGCTTAAACCCCTCCCTGTGGT
 GCTGTGCTTCAATGGTCCCACTCCTTGTCCACTTTCATGCTCCTCCCGTACTCCTGGTTCCCTCTTTGAAGAGCGCAGTAG
 ATAGCGGTAGAAGAAATAGTGAAAGTCTTAAAGTCTTCGATCTTTCTTACAAGTGCAGAGAAGAAAACGCTGACATATGC
 TGCCTTCCCTCTCTGCTTCGGCTACCTAAAAGGGAAGGGCCGCTATCCTGTAATCACATGACTTGCTTCACCTTGTCAA
 TCACTTAGAAGATTCACTCCTTACCCTGCCCCCTTGTCTTGTATGCAATAAATATCAGTGACCCCAGCCGTTACGGGC
 CACTACTGGTCTCCGCGTCTTGATGGTAGTGGTCACCCCGGCC

L50-LTR (U3-R)

TGTGGGTGGAGGATTACCCAGGTGCCAAGGCAAGAGACTGAAGGCACAACTGTTTCAGTATAATAAAAAAATAGAATA
 AGAATAGTCATAATACAAATTAGATATAGAGATGATCATGGACAATTAGCAATCACTATTAATCTTTAGCTTTTAAATATT
 ACTCTTTGTTGCATTACTAATATAACCTAGGAATAACCGGTGGGTATAGGGTCAGGTGCTGAAGGGACATTGTGAGAAGT
 GACCTGGAAGGCAAGAGGTGAGCCCTCTGTACGCCCCACATAAGGGCCGCTTGAGGGCTCCTTGGTCAAGTGGTAACGCC
 AGTGTCTGGGAATGCACCCGTTAATTAGCAGACCGCGAAAGGGAGTCTCCTTTCTTGGAAAGAGTTGGGGAACACTCTGC
 TCCACCAGCTTCTTGTGGAAGGCTGGATATTATCCAGGCCTGCGCGCAGTCATCCGGAGGCTTAAACCCCTCCCTGTGGT
 GCTGTGCTTCAATGGTCCCACTCCTTGTCCACTTTCATGCTCCTCCCGTACTCCTGGTTCCCTCTTTGAAGAGCGCAGTAG
 ATAGCGGTAGAAGAAATAGTGAAAGTCTTAAAGTCTTCGATCTTTCTTACAAGTGCAGAGAAGAAAACGCTGACATATGC
 TGCCTTCCCTCTCTGCTTCGGCTACCTAAAAGGGAAGGGCCGCTATCCTGTAATCACATGACTTGCTTCACCTTGTCAA
 TCACTTAGAAGATTCACTCCTTACCCTGCCCCCTTGTCTTGTATGCAATAAATATCAGTGACCCCAGCCGTTACGGGC
 CACTACTGGTCTCCGCGTCTTGATGGTAGTGGTCACCCCGGCCAGGTGTTTTTCTTT

29/29

L9-LTR (966 nt)

TGTGGGTGGAGGATTACCCAGGTGCCGAGGCAAGAGACTGAAGGCACAACTGTTTCAGTATAATAAAGAAAAATGGTTAG
 AATAAGAATAGTCATAATACAAATTAGATATAGAGATGATCATGGACAATTATCAATCATTATTATAAACATTATTAATC
 ATTAGCTTTTAATATTACTCTTTGTTGCATTACTAATAATAACCTAGGAATAACCGGTGGGTATAGGGTCAGGTGCTGAAA
 GGACATTGGGAGAAGTGACCTAGAAGGCAAGAGGTGAGTCTTCTGTACGCCCGCATAAGGGTTGCTTGAGGGCTCCTTG
 GTCAAGTGGTAACGCCGGTGTCTGGGAAGGCACCTGTTACTTAGCCGACCACGAAAGGGAGTCTCCTTTCTTGAGGAG
 TCAGGGCGCACTCTGCTCCACCAGCTTCTTGTGGAAGGCTGGATATTATCCAGGCCTGCCCGCAGTCATCCGGAGGCCA
 AACCCCTCCCTGTGGTGTCTGTGCTTCAATGGGCACACTCCTCGTCCACTTTTCATGTTCTCCCATACTCCTGGTTTCTCT
 TTGAAGTTTCGTAGTAGATAGTGGTAGAAGGAATAGGGAAAATCTTAAAGTGTGTTGATCTTTCTTATAAGTGCATAGAAGA
 AAACGCTGCATATGCTGCCTTCTCTGTCTGCTTCAGCTACCTAAGAGGGAAGGGCCCCCTGTCCAGTGATCACGTGACT
 TGCTTCACCTTGTCATCACTTAGAAGATTACCCCTCCTTACCTTGCCCCCTTGCTTGTATGCAATAAATATCAGTGCA
 CCCAGCCTTTCCGGGGCCACTTACCGGTCTCCACGTCTTGGTGGTAGTGGTCCCCCGGGCCAGCTGTTTTCTCTTTATCT
 CTTTGTCTTGTGTCTTATTTATTACAATCTCTCGTCTCCGCACACAGGGAGAACACCCGCTAAGCTCCGTAGGGCTGGAC
 CCTACA

L8-LTR (938 nt)

TGTGGGTGGAGGATTACCCAGGTGCCGAGGCAAGAGACTGAAGGCACAACTGTTTCAGTATAATAAAGAAAAATGGTTAG
 AATAAGAATAGTCATAATACAAATTAGATATAGAGATGATCATGGACAATTATCAATCATTATTATAAACATTATTAATC
 ATTAGCTTTTAATATTACTCTTTGTTGCATTACTAATAATAACCTAGGAATAACCGGTGGGTATAGGGTCAGGTGCTGAAG
 GGACATTGGGAGAAGTGACCTAGAAGGCAAGAGGTGAGTCTTCTGTACGCCCGCATAAGGGTTGCTTGAGGGCTCCTTG
 GTCAAGTGGTAACGCCGGTGTCTGGGAAGGCACCTGTTACTTAGCCGACCACGAAAGGGAGTCTCCTTTCTTGAGGAG
 TCAGGGCACACTCTGCTCCACCAGCTTCTTGTGGAAGGCTGGATATTATCCAGGCCTGCCCGCAGTCATCCGGAGGCCA
 AACCCCTCCCTGTGGTGTCTGTGCTTCAATGGGCACACTCCTCGTCCACTTTTCATGTTCTCCCATACTCCTGGTTCTCT
 TTGAAGTTTCGTAGTAGATAGTGGTAGAAGGAATAGGGAAAATCTTAAAGTGTGTTGATCTTTCTTATAAGTGCATAGAAGA
 AAACGCTGCATATGCTGCCTTCTCTGTCTGCTTCAGCTACCTAAGAGGGAAGGGCCCCCTGTCCAGTGATCACGTGACT
 TGCTTCACCTTGTCATCACTTAGAAGATTACCCCTCCTTACCTTGCCCCCTTGCTTGTATGCAATAAATATCAGTGCA
 CCCAGCCTTTCCGGKCACTTACCGGTCTCCACGTCTTGGTGGTAGTGGTCCCCCGGGCCAGCTGTTTTCTCTTTATCTCT
 TTGTCTTGTGTCTTATTTATTACAATCTCTCGTCTCCGCACACAGGGAGAACACCCGC (Abbruch 26 nt vor
 Ende der LTR)

L49-LTR = L20-LTR (963 nt)

TGTGGGCGAAAAGATTACCTAGGTGCCGAGGCAAGAGACTGAAGGCACAACTGTTTCAGTATAATAAAGAAAAATAGTTAA
 AATAAGAATAGTTATAATACAAATTAGATATAGAGATGATCATGGACAATTATCAATCATTATTATAAACATTATTAATCAT
 AGCTTTTAATATTACTCTTTGTTGCTTTACTAATAATAACCTAGGAATAACCGGTGGGTATAGGGTCAGGTGTTGACGGGA
 TATTGTGAGAAAGTGACCTAGAAGGCAAGAGGTGAGCCTTCTGTACGCCACATAAGGGCCGCTTGAGGGCTCTTTGGTC
 AAGTGGTAACGCCAGTGTCTGTGAAGGCACCTGTTACTTAGCAGACCGCGAAAGGGAGTCTCCTTTCTTGAGGAGTCA
 GGAACACTCTGCTCCACCAGCTTCTTGTGGAAGGCTGGATATTATCTAGGCCTGCCCGCAGTCATCTGGAGGCCATAAC
 CCTCCCTGTGGTGTCTGTGCTTCAGTGGTCACTCTCCTTGCTCCACTTTTCATGTTCTCCCGTACTCCTGGTTCCCTCTTG
 AAGTTCGTAGTAGATAGCAGTAGAAGAAATAGTGAAAGTCTTAAAGTATTTGATCTTTCTTATAAGTGCATAGAAGAAAA
 CGCTGACATATGCTGCCTTCTCTATCTCTGCGGTGGCTACCTAAAAGGGAAGGGCCCCCTGTCCCATGATCATGTGACTT
 GCTTCACCTTATCACTTAGAAGATTATCTCTCCTTACCTTGCGCCCCCTCGTCTTGTATGCAATAAATATCAGCACGCC
 AGTCGTTTGAGGCCACTGCCGGTCTCCGCGTCTTGGTGGTAGTGGTCCCCCGGGCCAGCTATTGTCTCTTTATCTCTTT
 GTCTTGTCTTTATTTATTACAATCTCTTGTCTCTGCACACAGGGAGAACACCTGCTAAGCCCCGTAGGACTGGACCCCT
 ACA

HERV-IP-T47D

TGTTCAATTCTTTGCCTTCTACTTTTAACTTAACTTCCCTATAAAGCAACCTTTTCAATCACCTGCTCCACTCTGACT
 CATTCTGATCACCTGCTCCACCCTGACTCATTCCGATCACCTGATCCACTGTGACTCATTCCGATTACCCGCTCCACCCT
 GACTCATTCTGATTCTGATTTTCTGCTCTGCCATAACCATTTTCCCGCCAAACCACTCACCTGTCACTCTCTTTAAAT
 TAGCCAATTGGAATTAGTTTAGCCTGTGCGGTCTAACCTAGCCAATAGGGGACTGACACAGCAGCAGGGGCCACATGTG
 TCAGGAATAAGACCCCCCTCCCCCTCCCTGTCCAGATGTGTGCTCACCATTGCTCCATCTGTGAGGGCACACCCCTTCTATA
 GAAGTAAATTGCCCTTGCTGAGAAGAAAAAAGAACATTTTATATTCAAGTCTATTTCTTTGCTGCACCGAAACTTTA
 TTTATAACA